

# MOTOR AGE

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MOTOR AGE, July, 1936

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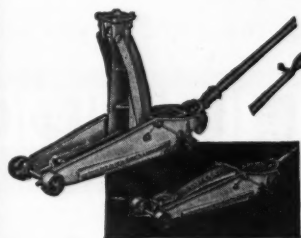
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Lowers to 3 3/4 inches and raises up to 22 inches. Long handle, speed pump and overload safety device. Capacity, 2 tons.

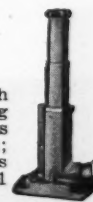


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**Y**OUR customers never see the brake lining you sell them, once it's installed . . . but its performance forces itself to their attention dozens of times a day. That's why it pays to sell SAFETY rather than just a brake lining job . . . and why you need Ferodo Brake Linings to back you up by delivering the SAFETY you claim.



*See your wholesaler today, or write direct to us.*

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**SEALED SETS • KA-MO LININGS • CLUTCH FACINGS**





**B**ATHERS and vacationers in general can keep cool, but there is no way for the automobile to dodge the sun and the heat, which will result in plenty of body polishing, touch up work and other jobs.

One aggressive shop hired a high school boy to bring in the business. Result—twelve additional body polishing jobs per day. There are many other summertime maintenance needs—and plenty of business for those who go after it.

*Bill Toboldt*



## Don Herr Goes Super Service!

**Nationally Known Maintenance  
Man Adds Quick Service Facilities  
To Complete His Shop Set-Up**

NOT that Don Herr had ever been opposed to super service, but all the years he has been in business in Indianapolis, Don had concentrated on heavy repairs, wrecks, insurance work, etc. That this business had been highly successful is plain from the large three-story building with 24,000 sq. ft. of floor space which he has kept filled with business during the past 14 years.

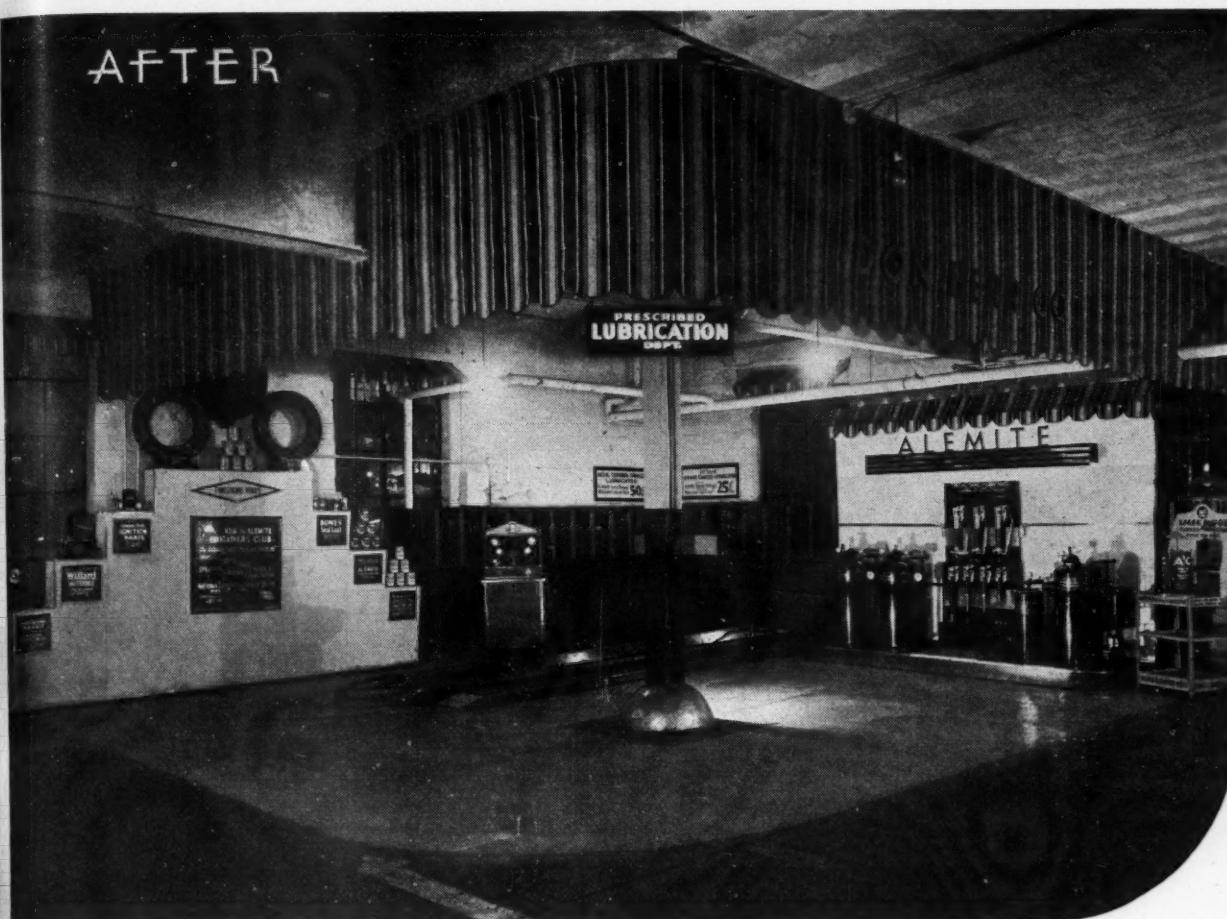
So it came as a distinct surprise when I walked into his shop and found him superintending the finishing touches on one of the most modern lubrication departments I have seen.

There are few people in the automotive maintenance business who have not heard of Don Herr. His career started practically with the beginning of the industry. As a race driver, in the days when Ray





AFTER



**By Don Herr  
as told to Bill Toboldt**

Harroun, Joe Dawson and Ralph DePalma were battling their way to fame, Don was doing his share. However, he is probably better known for his efforts in forming a national maintenance association and his work in connection with the service men's code under the N.R.A.

So when a man of Don's calibre makes a radical change in his business, its news, indeed, and I determined to get all of the details.

"Yes," said Don in response to my question, "I've gone super service and what's more I should have started at least five years ago. But it has taken all this time to convince me that that is the way the maintenance business is going and it required the depression to force home the facts. And when I say I have gone super service I mean I am emphasizing and concentrating on those services, such as brakes, lubrication, gasoline and oil sales, wheel alignment and batteries, which the customer buys most fre-

A modern lubrication department in Don Herr's maintenance shop, which for years has successfully handled heavy repairs. On the opposite page is the lubrication department *before* the stress was placed on super service. Above is shown the same spot *after*. Note the difference!

quently. And I am using those jobs as an opportunity to sell additional maintenance services.

"When the depression started I was sitting on top of the world, as far as the maintenance business goes and it wasn't until 1931 that things began to slip. At first I didn't do anything but just sit tight. Then as each month got worse, I just had to do something.

"The first thing I found was that collision insurance on automobiles had dropped 80 per cent. Well, with a good portion of my repair business coming from insurance companies, that looked pretty bad.

"The next thing I checked was the number of lubrication jobs that I was doing and also the number being done by the super service stations and filling stations in my immediate neighborhood.

"I found that I was doing from

150 to 200 jobs per month and that was without making any effort to go after that sort of business. In other words, I had 200 customers per month who came in and bought lubrication jobs. I didn't sell them, the customers bought them. There's a big difference. Then as near as could be learned, filling stations in the neighborhood were doing from 50 to 100 jobs per month, while super service stations were doing 200 to 300 jobs per month. One station was doing 1000 jobs per month. Furthermore there are 108,000 cars operating in this county.

"Of course, there are a lot of rattletraps operating that aren't lubricated from one year's end to the next. But if one shop can get 1000 lubrication jobs per month so can I. And what's more every customer that comes in here for a lubrication job is a darn good prospect for some additional service.

"Oh I know you trade paper men have been shouting super-service for a long time. But it never seemed to apply to me.

"Well anyhow, about three weeks ago, I went out and bought some

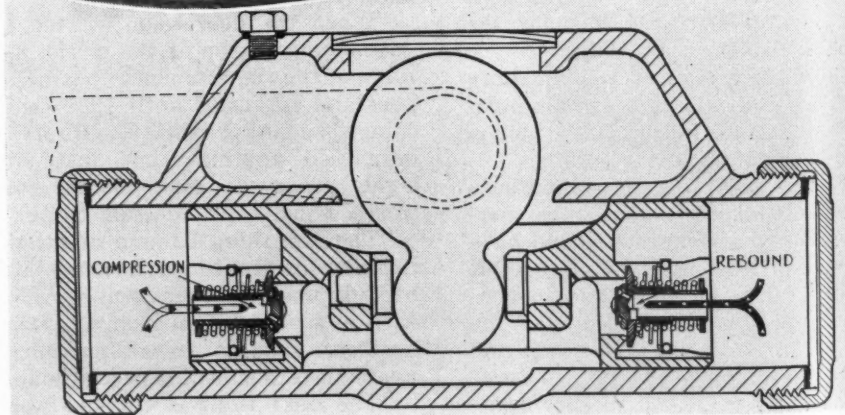
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# Breaking In



SINCE the introduction of independent front-wheel suspension and softer springs, the action of shock absorbers has become more important, and it is increasingly important that these units receive periodic attention if the good riding qualities are to be maintained.

In addition to their effect on riding, shock absorbers may contribute to noises and bumps in the front end, shimmy, body roll, that unsteady feeling in the steering wheel, and bumps and rumbles from the rear of the car. The service station that does not go in for shock absorber service is not only



passing up an opportunity to make extra profit, but is overlooking an item of service that is very impor-

tant to the comfort and operating satisfaction of the car owner.

Like any other mechanical de-



# a B O U G H Rider

## By Proper Shock Absorber Adjustment

By Robert Hankinson

vice, there are several things that can happen to a shock absorber, but by far the most common cause of complaint is due to lack of oil. There should be no lost motion in the shock absorber arm, and will be none if the shock is full of oil. Small leaks around the camshaft and at the covers will soon allow all of the oil to be pumped out. Loose link pins and improper mounting of the shock to the frame will produce noises that are hard to locate, while worn pistons and broken relief valve springs or clogged relief valves will make the shock absorber inoperative.

Most of the mountings of the Delco shock absorbers permit refilling without removing the shock from the car. Care should be taken to be sure that all the air is expelled from the shock while it is being filled. Disconnect the link from the axle pad and work the arm up and down several times after the oil has been poured in, and continue this operation until no

more bubbles appear, adding oil until the shock is full.

### Servicing Delco-Lovejoy Single Acting Series 1500 to 1509, 1525 to 1529

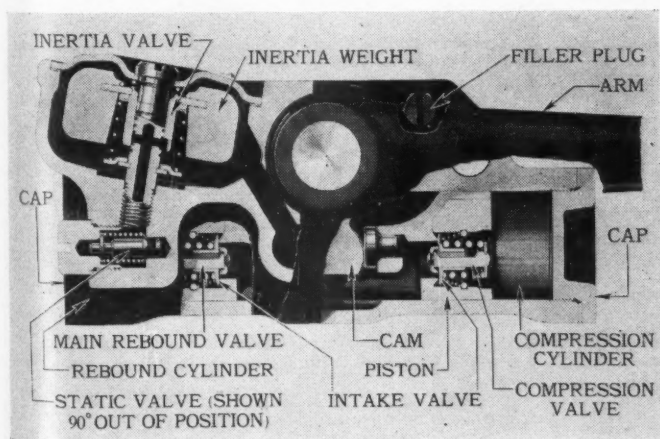
When complaints of poor riding are received on these types of units, check first to be sure that springs are lubricated, spring shackles are properly adjusted and lubricated and that tires are inflated to proper pressure. If the complaint is of too rigid riding, change the relief valve to one of less resistance; change to one of greater resistance if the complaint is of too flexible a ride. A new type relief valve is supplied for this series shock absorber. The new type is longer than the first type, and projects through the relief valve spring and into the relief valve nut. Therefore it is necessary to change the relief valve nut when changing

from the first to the second type valve.

When checking for noise, make sure that the shock absorber is bolted tight to the frame. If a clicking sound is heard only on compression of the front springs, it may be caused by the web strap being stretched so that the operating cam strikes the inside of the cover of the shock. To correct this, shorten the strap so that the arm is slightly below the horizontal position.

To disassemble the unit, remove it from the car and place in a vise, taking care not to tighten the vise enough to distort or crack the body of the shock. Remove the relief valve nut and valve, and allow the oil to drain out. Then push the arm down and insert a punch in the relief valve hole so that it will enter the hole in the side of the piston. Remove the cover screws, cover, and cam set screw, and tap the arm out gently. With a screwdriver, push down the piston and release the punch, then let the piston come up slowly until the compression spring is released, after which the piston and spring can be removed. To reassemble, reverse the procedure.

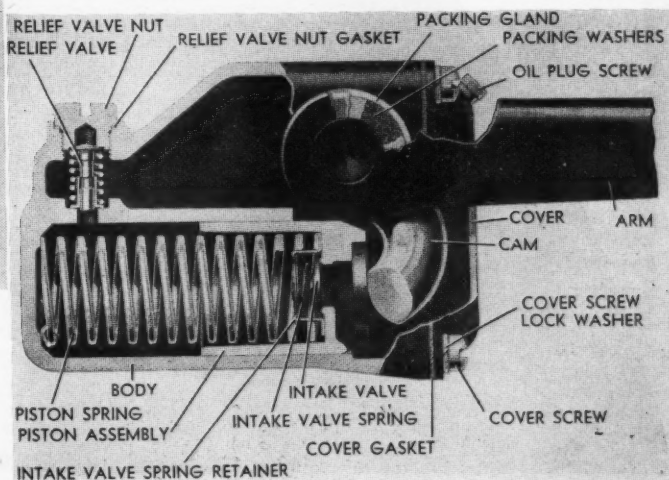
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Above—Delco-Lovejoy double-acting shock absorber with inertia weight and static valve control.

Left—Showing location of compression and rebound valves in double-acting shock absorber.

Right—Delco-Lovejoy single-acting unit.



# Bonus Payments To Servicemen Boosts Business

## Maintenance Man's Own System Helps—

**"F**OR three years we found increased sales and extra profits through the continued use of our bonus system," says Donald Greene, president of Don's, Inc., New Bedford, Mass., garage and super service station.

"In addition to regular weekly pay, each man in the organization receives a bonus for the sale of each individual item which he makes. This bonus system includes repairmen, office employees, station attendants and all others in our employ. It is a plan which makes EVERY employee an active salesman."

Here is Mr. Green's unusual

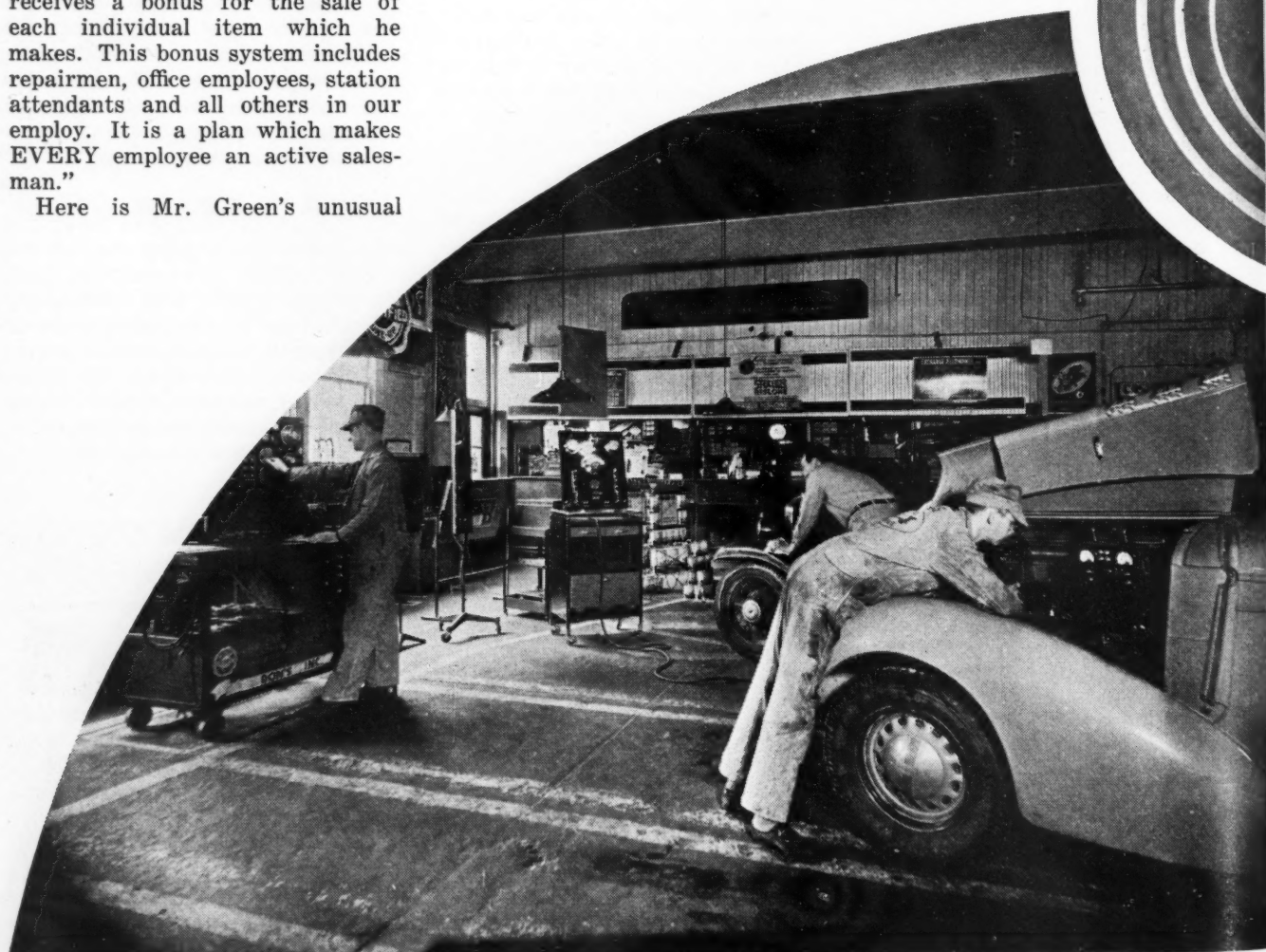
***Make 'Em Better Salesmen***

***Stimulate New Business***

***Increase Unit of Sale***

***Pay Men Extra Cash***

***Revive Old Trade***







Don Greene, owner of Don's, Inc., New Bedford, Mass., independent repair shop, whose bonus payment plan has increased service sales.

**By M. S. Sullivan**

from claiming any bonuses that are not due. And, incidentally, a great deal of office routine is done away with.

"The plan has definitely increased our sales," explains Mr. Greene. "One bonus, for instance, for the return of an old customer has induced our men to contact old customers whenever and wherever possible and many of these are brought back to us. Even out of working hours, our men are always working indirectly for new customers, since it means extra money for them. And during working hours it is surprising how they have promoted the sale of our various products and services.

"It is difficult to quote any given percentage due directly to giving these bonuses, since we always carry on a wide and well-planned advertising program, using newspapers, billboards, direct-mail, radio and other media. However, in one recent compilation of figures, we sold 33 1/3 per cent more automobile radios than we had previously sold. During that same period, our oil sales jumped 40 per cent. We added new customers and sold more automobile parts, more tires and tubes. Thus, we do know definitely that this bonus plan, in use for more than three years, has proven a practical, inexpensive sales booster.

bonus system as it is used. Each individual item in stock carries a given bonus payment for its sale. Bonuses are NOT in percentages, but represent stated cash sums. These sums have been figured out previously to represent amounts which could be paid and still represent a profitable sale for the firm. Most items carry a 5-cent bonus; some a 10-cent payment; the larger the retail price of the product, the larger the bonus payment. There is a bonus for a new customer, a lubrication job, all repair jobs—*every product or service has its bonus.* In all there are approximately 50 bonuses, each representing an opportunity for each employee to increase the size of his week's payment.

Bonuses are not paid for the first item or service sold to a customer, since Mr. Greene believes that his consistent advertising program

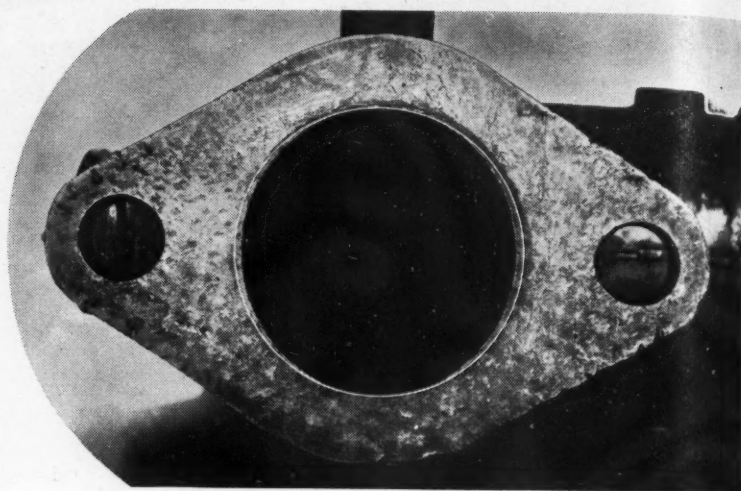
brings people to his station for one sale. Bonuses are paid on second and following sales, which represent a true test of selling ability.

For instance, if a motorist buys gasoline and nothing else, no bonus is paid. If that motorist should buy gasoline and a tire or a lubrication job or a tube or such, the salesman would receive a bonus for the second sale. It thus gives each man a real urge to promote sales when motorists visit the station for some product or service.

Mr. Greene keeps an accurate record of the names and addresses of all customers. Employees must record this information on each sales slip. When these slips denote a new customer, that brings a bonus.

Bonuses are paid at once when the salesman presents the sales slip at the office for claim of the bonus. Mr. Greene finds that this simple way of making the payments works very well without undue losses. All employees are frequently warned that the office can and does check claims for bonus payments which prevents the men

# Fuel Economy



## From The Race Track To The Repair Shop

**Carburetion is a mighty important factor in determining the miles per gallon you get!**

**By J. R. Turner**

**L**OU MEYER averaging nearly 15 miles per gallon for 500 miles at an average speed of 109.069 m.p.h. at the recent Indianapolis race has given added impetus to the public's demand for better fuel economy. If Lou can get 15 m.p.g. at such high speeds, why do I only get 10 m.p.g. at only 45 m.p.h. seems to be the substance of the public's query.

Naturally the public overlooks the facts that Meyer had a special race engine with a compression ratio of approximately 15 to 1, used special fuel, was specially tuned and the complete car weighed only 7.4 lb. for each cu. in. of displacement. Whereas a conventional passenger car engine has a compression ratio of approximately 6 to 1 with the com-

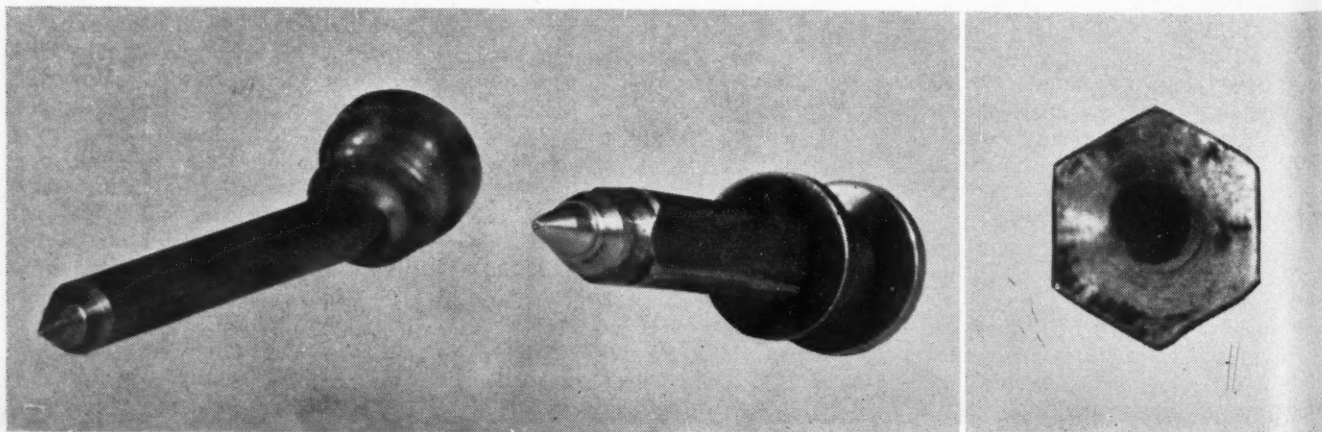
plete car weighing approximately 14 lb. for each cu. in. of displacement.

Of course, cars can be built to give 25 to 30 m.p.g. But performance or riding comfort would be sacrificed, though the use of over-drive units go a long way toward improving fuel economy without sacrificing performance and riding comfort.

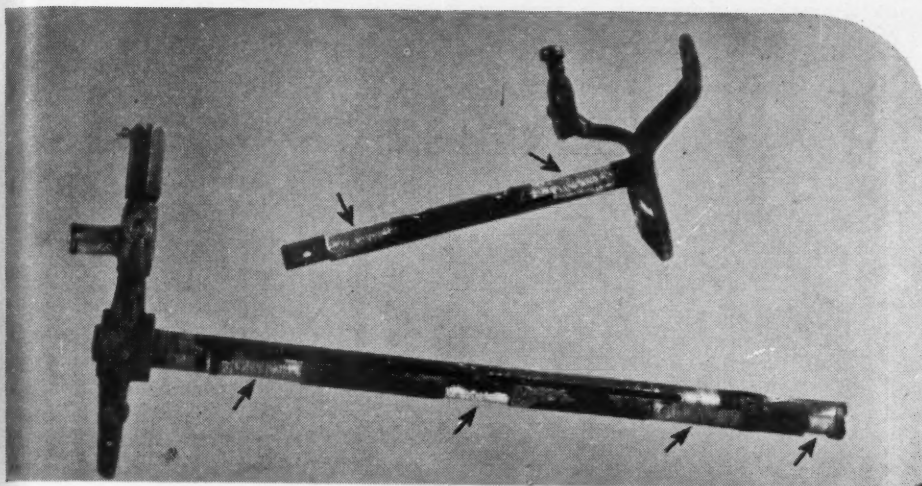
However, the mechanic cannot soothe an irate customer's demands for better fuel economy

with a discourse of engineering developments. He has to deal with the automobile as he finds it. And the answer seems to be tuning, more tuning and still more tuning. That is assuming, of course, that the brakes are not dragging, the wheels are in alignment and that the clutch is not slipping.

One of the most important points in connection with tuning is the adjustment of the carburetor. Unfortunately, many mechanics simply turn the idling adjust-





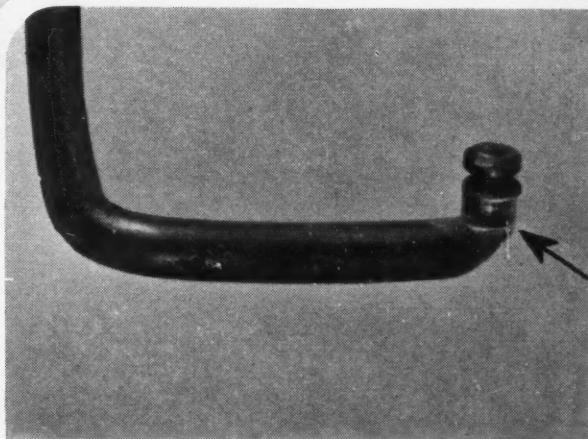


Opposite page: Note the eccentricity of this carburetor throat. Left: Uneven idling and poor fuel economy result when worn throttle shafts are used.



Left: Note the ridges on the needle valves and wear in the carburetor jet. The jet is enlarged about six times.

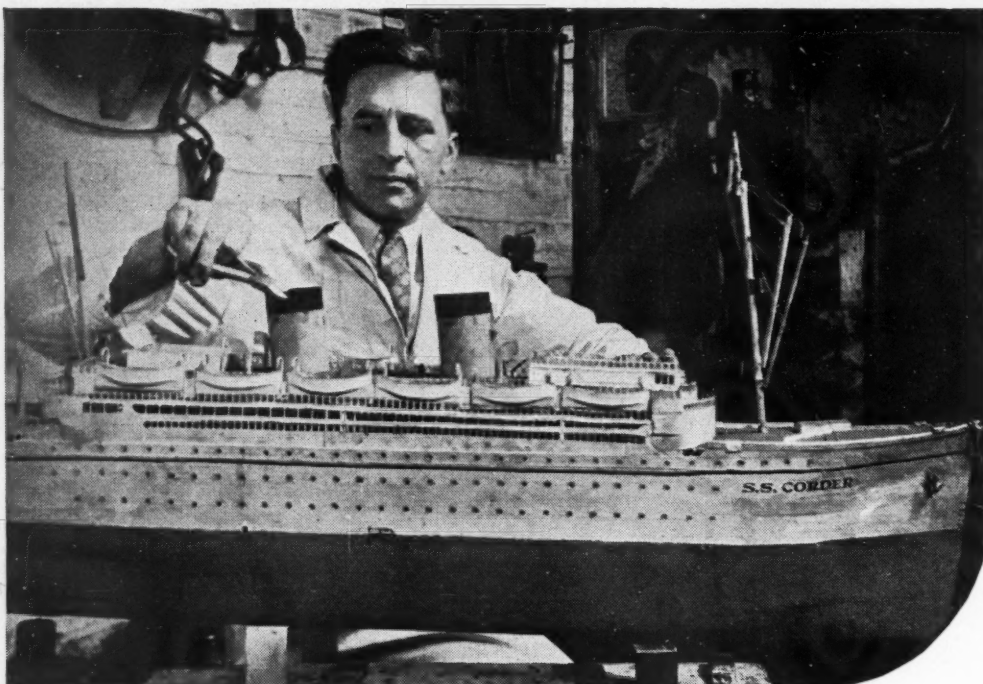
Right: The wear in the throttle connector rod would result in poor idling and poor timing of the accelerator pump.



ment screw until smooth idling is secured. That, of course, takes care of the idling, but that's all, and if there are any air leaks present or any of the jets are worn, the engine will be consuming more fuel than it should.

On cars that have been driven in excess of 10,000 miles it is necessary to dismantle and check the entire carburetor—jets, linkage, accelerator pump, economizer, throttle shaft, choke, ball checks, needle valves and the carburetor body itself. All of these parts with the exception of the carburetor body are subject to wear and the body in many instances will warp and affect economy and smooth operation. The pictures accompanying this article tell the story.

After dismantling the carburetor, it should be thoroughly cleaned so as to facilitate the inspection of the various parts. In this connection a high quality magnifying glass is essential to examine the jets and  
(Continued on page 83)



Spreckles Lake, Golden Gate Park, where Corder often competes with other model boat racing enthusiasts.

The "S. S. Corder," named after the brake specialist, is regularly on display in the shop. Old bronze bushings were used in the construction of its cylinders, old scrap for the keel, and the scrap metal from five-quart oil cans for the top deck. Practically everything entering in the construction of the boat, except the bilge pump, boiler pump and the priming pump, were made out of shop scrap.

## Repairmen And Their Hobbies

**W**HEN he isn't busy relining and adjusting brakes, John J. Corder, who operates a busy brake shop in San Francisco, spends his time constructing model ships for racing. Corder, who is shown above, enjoys the sport, considering it also profitable, because it has given him considerable publicity in the local newspapers, and has at-

tracted many customers to his shop.

Corder has built several fine model specimens out of shop scrap. The latest addition to his collection of model ships is a replica of an ocean liner which operates on a two-cylinder single-timing steam engine, and is capable of doing 12 knots an hour. The boat can travel 45 minutes on a pint of gasoline, which is mighty economical sport for a Sunday afternoon on

**B. S. MATSUMURA**, shown in the two pictures below, is a Japanese auto repair man of San Francisco. He keeps young and nimble despite his 53 years. His hobby is "Kan-Do"! That's not a patent medicine, but the ancient sport of Japan—fencing with 38-inch bamboo clubs. Before coming to the United States 30 years, Matsumura served as a "Kan-Do" instructor in the Japanese army, and has since won many championships in contests staged by his countrymen on the Pacific Coast.

When not busy grinding cylinders in his well-equipped shop, Matsumura likes nothing better than to exhibit his skill to visiting jobber salesmen. More than one

*(Continued on page 60)*





# Let Freedom Ring

*By Julian Chase*

IN the days when the Eighteenth Amendment to the Constitution of the United States was in force and, before that, when it was being proposed and urged upon us by lots of well-meaning Americans, anyone who argued the other way exposed himself to the charge of being reactionary, of being in sympathy with intemperance, of being in cahoots with the liquor interests, of having no regard for the victims of drunkenness.

Some, nevertheless, tried to point out that national prohibition could not be made to work. They argued, further, that any attempt to control individual morals (that's what the Prohibitionists called the drinking of alcohol beverages, including light wines and beer) was not a proper activity for our national government. They attempted to convince those who would listen to them that the necessary effort to enforce national prohibition would bring with it not only an invasion of individual rights but would also tend to develop autocratic bureaucracy, encourage lawlessness and extend crookedness in politics.

About all that these champions of true Americanism got for their trouble was hard thoughts and nasty words. But history proved them right.

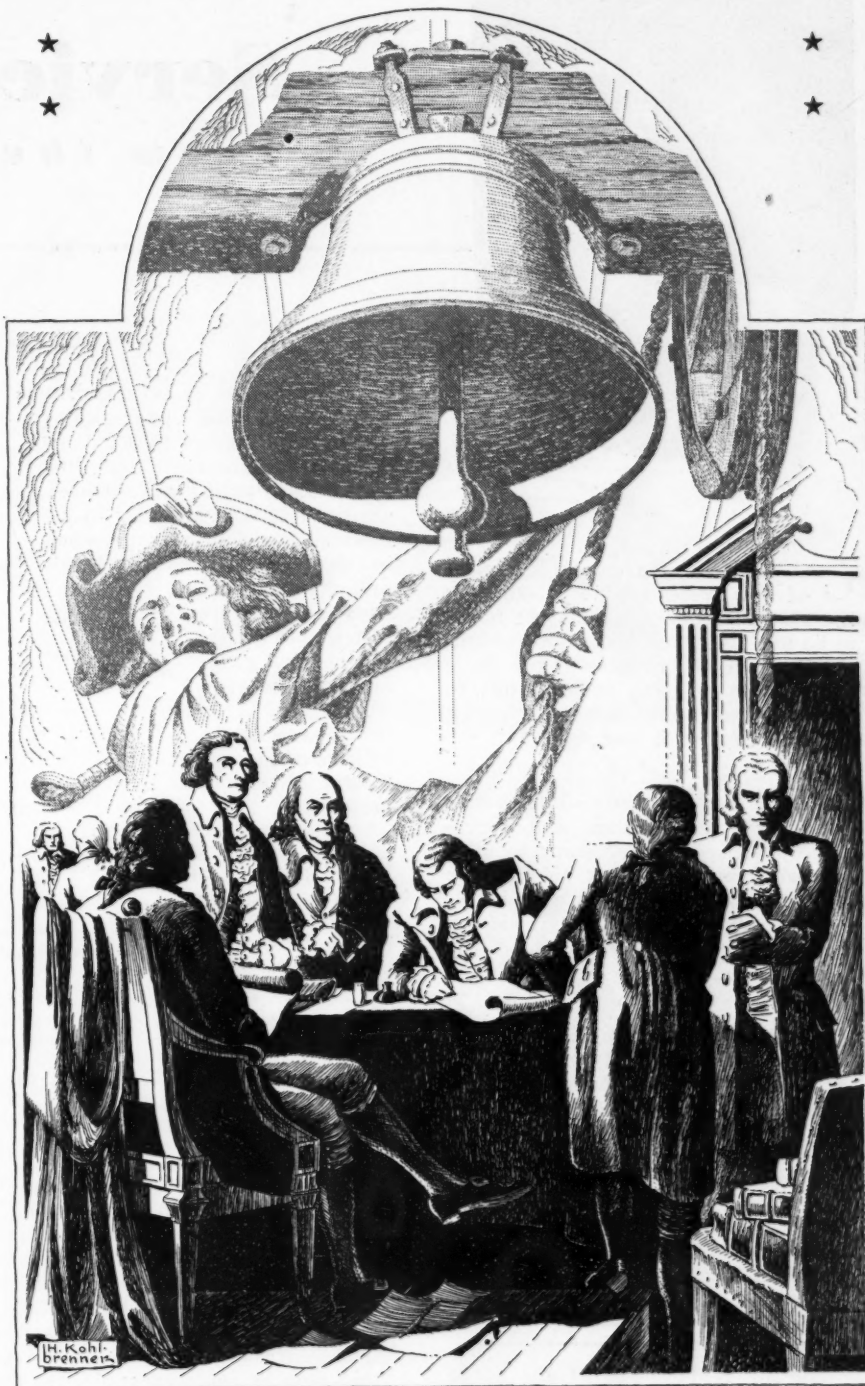
Today we have among us some who would extend governmental control over many of our daily activities. They would have the national government fix working

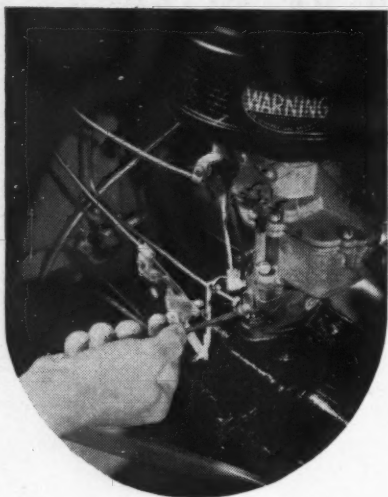
hours, wages and prices, limit production and regulate it. They would pass national laws so that the government can divide the wealth of the country and tell individuals what they can have and cannot have. They would put the national government more and more into business in competition with individual citizens and with companies who now pay more to the government in taxes than they do to their stockholders in dividends and many times more to workers, whose livelihood they provide, than they pay

in both taxes and dividends.

To those who oppose these suggestions and try to show that to carry them out will take us away from real Americanism and tend to give us, instead, a form of governmental dictatorship and an unwise restriction of individual freedom, the answer is likely to be that they are reactionaries, that they have no sympathy for the underprivileged, that they favor the "vested interests," whatever those words may mean.

*(Continued on page 64)*





## Service Hints

### From the Factories

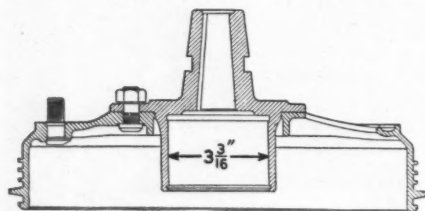
**C**ASES of uneven engine idling, or of low-speed engine missing in the 1936 Pontiac models may be found to be due to an air leak at the windshield wiper rubber hose at the dash. If the hose is loose, or torn, due to burrs on the copper tubing, it should be replaced with a new one.

\* \* \*

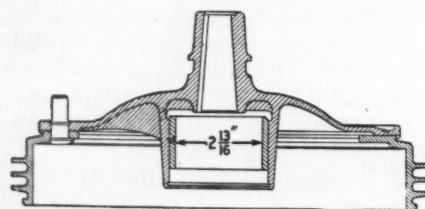
**W**HEN draining the cooling system of the 1936 Hudson and Terraplane models, it is necessary to open the pet cock in the left side of the radiator lower tank, and also to remove the pipe plug in the left side of the cylinder block just back of the cylinder side plate.

\* \* \*

**A** CHANGE has been made in production of the 1936 Ford V-8, incorporating a rear wheel bearing smaller in outside diameter and pro-



viding for replacement of the outer bearing sleeve as a service operation. The first type bearing was 3 3/16 in. outside diameter, and the new bearing is 2 13/16 in. This, of course, necessitates a change in the wheel hub. The larger bearing should not be used in the new hub, even though it will fit in the hub if the outer sleeve is omitted, as the cast type hub must have a hardened and ground sleeve to provide a suitable bearing surface.



**C**ARE must be exercised when replacing the upper radiator hose connection on the 1936 Studebaker models to see that the thermostat is in the proper position. If it is installed in an inverted position, back pressure in the cooling system will result, and may be great enough to force water past the cylinder head gasket and into the block. The hose must be installed with the bellows of the thermostat toward the bottom.

\* \* \*

**T**HE proper procedure for removing the light switch from the instrument board of the 1936 Studebaker models is as follows:

Place the light switch in the driving light position.

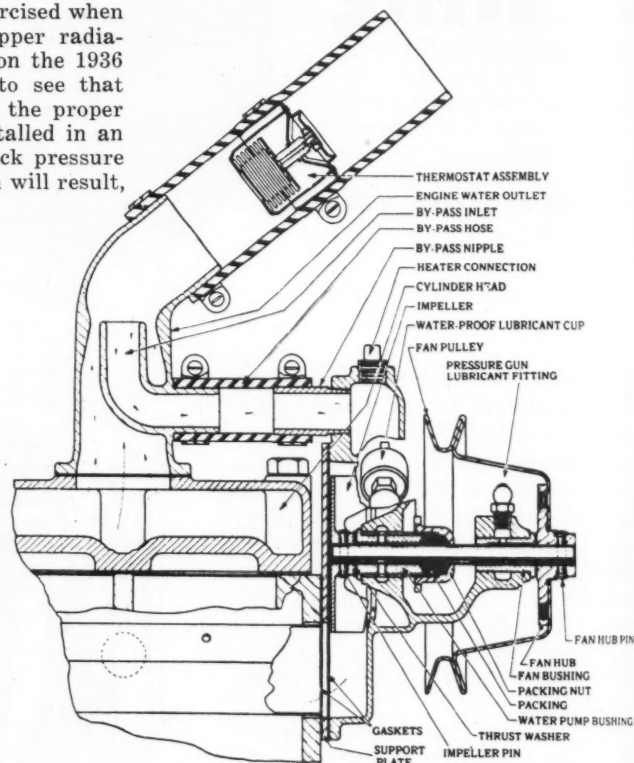
Press up slightly on the spring in the light switch by inserting a small screw driver or ice pick through the hole in the bottom of the switch, and remove plunger and control button assembly.

Remove switch fastening nut by means of a screw driver. The switch can now be removed and wires disconnected.

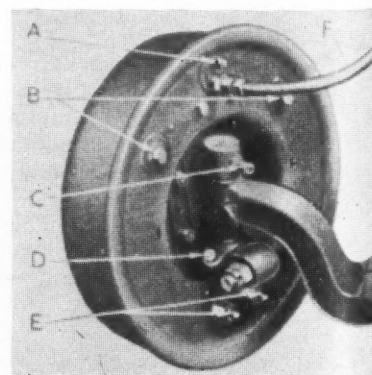
Under no circumstances should the spring be pried up, as it will undoubtedly result in breaking the spring or switch.

\* \* \*

**A** LOW speed miss during acceleration, or during a hard pull, that can be traced to No. 7 cylinder of the 1936 Oldsmobile 8-cylinder cars, may be caused by a short between the distributor rotor and the wire connecting the low tension post to the breaker arm. This can be corrected by pushing the wire down, out of the way of the rotor, or by installing a new wire if the present one has been worn by the rotor.



**S**OME cases of interference between the hydraulic brake hose and the shock absorbers when the front wheels are turned at a sharp angle have been encountered with the Graham 1935 Six, Eight and Super-



charged Eight. This condition has been overcome by installing a 45-deg. angle brake hose inlet connection.





Bo Brown

"I see Jake and his girl ain't speakin' again!"



# Profitable Ideas

## What Is A Battery?

**R**OBERT E. LEE, owner of a garage and service station in Milwaukee, Wis., recently put over a battery selling campaign based on two large display signs that told his customers what a battery was, how it was constructed and how it worked. The campaign produced more than 100 sales the first month from a previous low of 20.

Mr. Lee worked on the idea that very few people actually know what makes a good battery. Therefore he made two large signs, entitling one, "What Is a Battery?" and the other "A Battery Story," reproduced below.

Written in language that the average man could understand, Mr. Lee watched customers stand before the signs, read them carefully from start to finish. Many of them asked for demonstrations.

The signs helped sell more "quality" batteries and saved R. E. Lee's selling time.

Mr. Lee tells us that he started his kind of an educational program on batteries, due to the fact that he found the average car owner had been

misled on batteries, and actually did not know how to judge the power of a good one. He tried to put these facts into simple, understandable language and succeeded, for many customers have told him that they learned more about batteries after reading these signs.

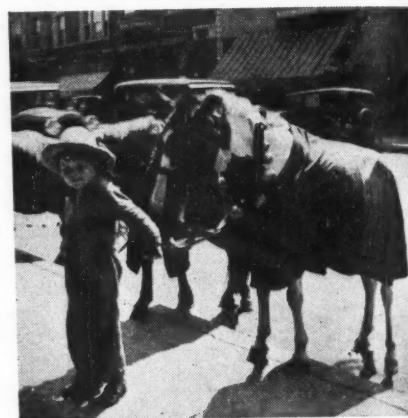
## Pony Contest

**T**WENTY-FIVE years ago, horse dealers were probably offering toy autos as prizes in business promotions.

Recently, auto men of a Middle Western community grouped together to stage a contest in which the awards were ponies.

When a customer purchased anything at these establishments, he received a ticket showing the amount of the purchase. The prizes were to go to persons accumulating tickets totaling the largest amount.

A rodeo spirit entered the picture. Ten ponies, a real cowboy from Texas, outfitted in conventional regalia, paraded the main street of Roseland daily.



Contest rules and pep editorials appeared weekly in *The Calumet Index*. Pony stores used the silhouette of a pony's head on advertising and display windows. Coupons were issued with every purchase from ten cents up. The coupons were in denominations of 10 cents, 25 cents, 50 cents, \$1 and \$5, in gray, pink, orange, blue and yellow. All coupons a contestant collected counted for him whether he made the purchases or not.

At the conclusion of the contest, each entrant deposited bundles at the *Index* office, receiving a duplicate of a deposit slip bearing a number. The original, containing his name and address and the value of the coupons,

## A Battery Story

Look at battery No. 1. Would it start your car at low temperatures? (Note the size of plates.)

Answer—This battery tested at 0° with a 300 ampere draw lasted just 42 seconds. Not enough pep to do the trick.

Look at Battery No. 2. Would you trust your car out in the country late at night in below zero temperatures with a battery like this? (Note the size and thinness of the plates.)

Answer—If you did you'd have to call for a tow car. This battery delivered 300 amperes for 43 seconds at 0°. Not enough to start on a cold night.

Look at Battery No. 3. This looks better. Would it satisfy you? (Note the plates appear full size.)

Answer—No—this battery is of a low capacity. It delivered 300 amperes of current at 0° for 1.2 minute. On a cold night it prob-

ably wouldn't start a motor and surely not for a second time.

Now look at Battery No. 4. This battery tested 0° with a 300 ampere draw, lasted 4.5 minutes, nearly six and one-half times as long as battery No. 1, over 6.2 times that of battery No. 2, and over 3.7 times that of No. 3.

You see, the size and kind of material in the plates play an important part in the amount of work a battery can do.

Battery No. 1 was purchased for \$2.95 exchange, No. 2 for \$3.50, and No. 3 for \$4.50. These batteries are cheap replacements. Let the buyer beware.

This battery, No. 4, costs about 10 per cent more than a standard, but will do nearly 50 per cent more work. Will you take a chance on an inferior grade?

Step inside for further facts and comparisons. Know what you buy.

## What is a Battery?

All car batteries today are made up of insulated plates of compounded lead immersed in a bath of sulphuric acid and enclosed in a divided case made of compounded rubber. All so designed that chemical action produces an electrical current.

The design, the size and the secret of the compounded plates, and even the case, all lend a hand in the output of the battery. On the table nearby several batteries are shown. Note the size of the plates, the straps and post construction. Note the inside and the material of the cases.

You must depend on the manufacturer for the quality of the

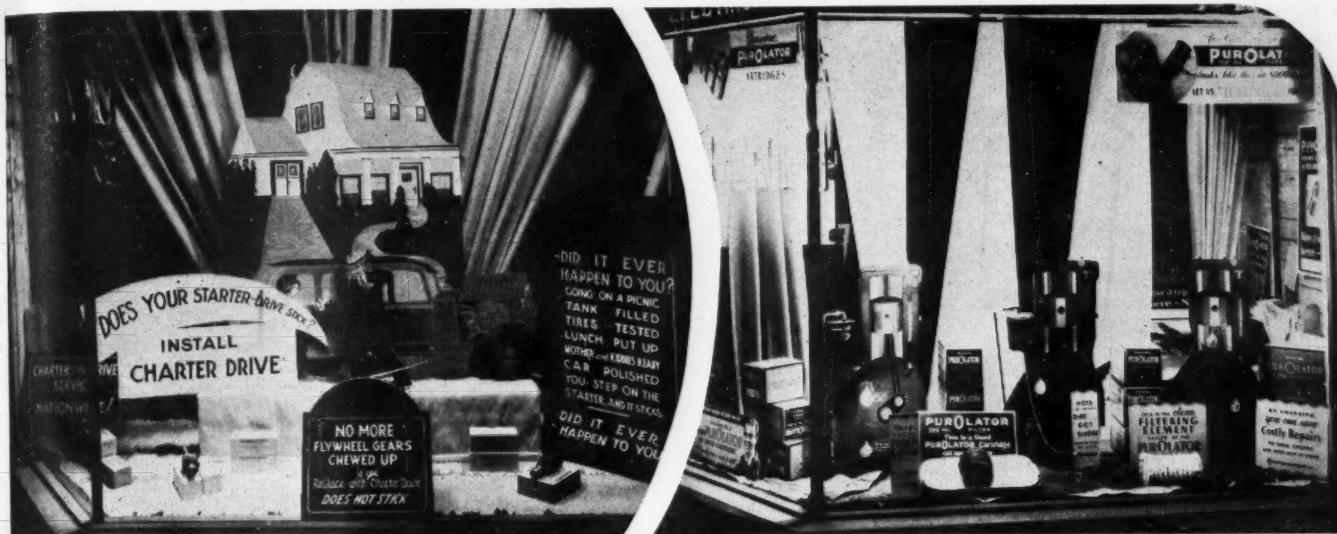
plates. Many plates do not release electrical energy easily at extreme cold temperatures. Some plates lose active material which falls to bottom prematurely. Cheaply compounded cases become porous and "leak" across (Ask attendants to make demonstration test).

Even the separators play an important part. Straight grain separators of Port Orford cedar are considered best. Cheap separators are usually rotary cut and may not be cured properly, causing slow shorts and counter chemical action.

Robert E. Lee proclaims a policy of selling batteries entirely on their merits. You are assured of the most for your money...

Lee's signs educate his prospects and make battery sales easier.





By constant practice Marks has developed his skill at window display—now he's a prize winner among repairmen.

**FRANK TICHE**, managing editor of *MOTOR AGE*, conducts this digest of helpful selling ideas.

These are practical methods used every day by automotive maintenance men, just like yourself.

You're welcome to use any or all of these "Profitable Ideas." And we'll be glad to have you write us outlining the method you use to promote profits for your service station.

Read these helpful hints and write us your suggestions.

### Windowizing

**EARL MARKS**, Portland, Ore., automotive electrical specialist, uses his windows to advertise his business, bring customers in, and to build prestige for his shop. He does the window displays himself.

The two windows presented here through photographs show that Mr. Marks is not content with regimenting accessories in a window, putting in some crepe paper pulls, and letting dust and flies do the rest. Instead, his plan is to get the attention—and keep it! — with accessory displays which are as pointed, alive, active as the verbal sales talk.

Note the one with the miniature house in the background, and the stalled car and its occupants in the middle foreground. Then the sales message: "Did it ever happen to you? Going on a picnic, tank filled, lunch put up, mothers and kiddies ready, car polished—you step on the starter, and it sticks—DID IT EVER HAPPEN TO YOU?"

The other window suggests—"Let us recartridge for you"—sells Mr. Motorist on the necessity of recartridgeing by showing the condition of an 8000-mile cartridge and a new one, in both exterior and interior form. "This is an old Purolator cartridge

cut open"—"This is the Clean filtering Element sealed in the Purolator"—"Note the harmful dirt, grit, sludge removed from the engine"—signs like these make a sales build-up for Earl Marks' business.

### They Steal His Advertising

**ARTHUR E. SMITH**, head of Smith & Gregory of New York, Inc., operator of three shops in metropolitan New York, found an inexpensive way to advertise his business. He supplies pencils imprinted with the company name and addresses of its branches. Checking up on his adver-

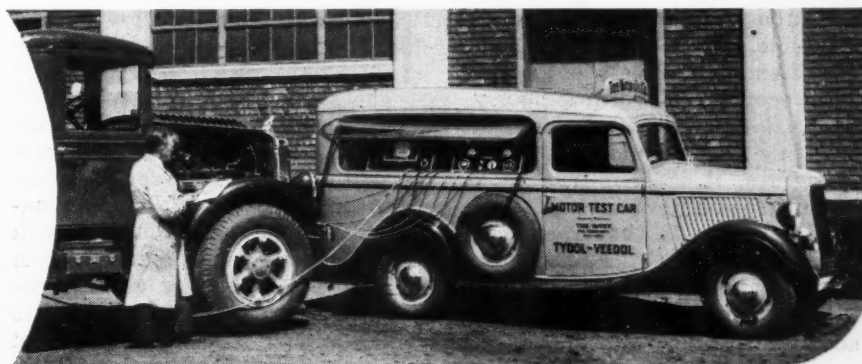


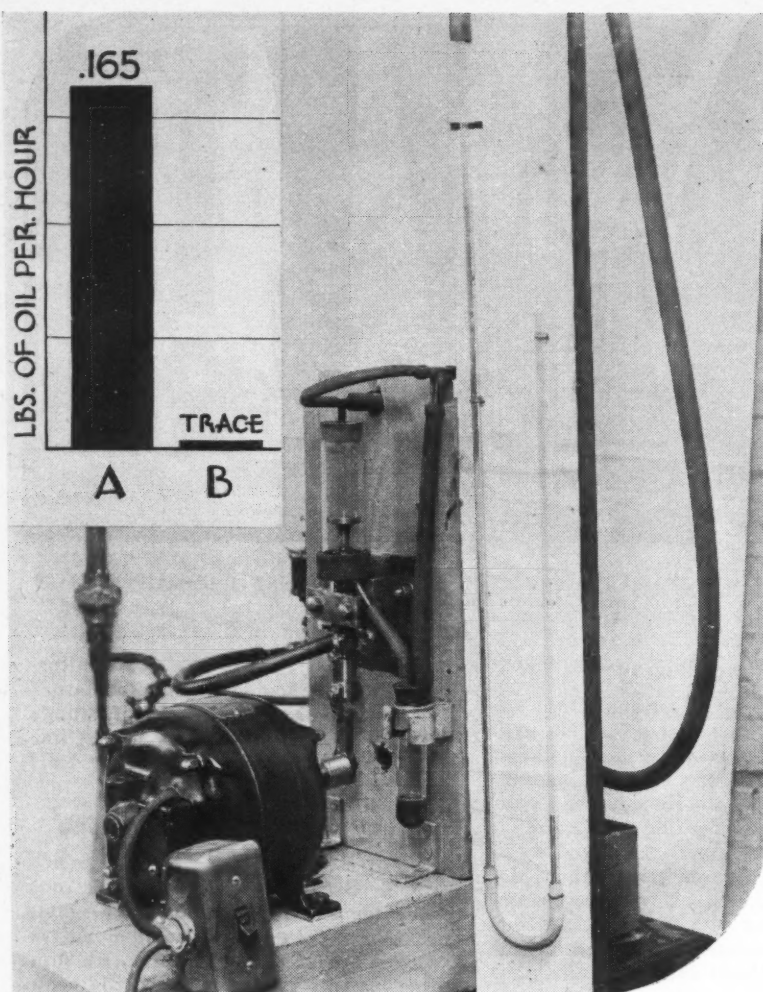
tising he finds that people not only accept, read and remember the advertising—they steal the pencils from him when he isn't looking. S & G also uses large green blotters, 18 x 24 in., imprinted with the company name and supplies them to fleet operators, dealers and other independents with whom they do business.

### Traveling Tune-up

A new engine inspection and tune-up service for car owners and for operators of trucks or busses has been inaugurated by Tide Water Oil Company, makers of Veedol motor oil and Tydol gasoline in the company's eastern seaboard territory.

Six new type service vehicles, on Ford ½-ton chassis, called "Tide Water Botor Test Cars." Each car has a glass show case mounted in the right-hand side of the specially designed body containing the testing instruments, and the interiors of the cars are so arranged that the dozens of scientific appliances may be brought into play within a few seconds.





Equipment developed by the Wilkening Mfg. Co. to check the amount of oil leakage past the valve stems. The results are shown in the chart, "A" being the amount of leakage past a valve stem without packing and having .006 in. clearance. "B" shows the amount of leakage for the same valve and guide fitted with valve packing, the duration of the test being 2000 hours.

## Don't Overlook Worn Valve Stems

**F**EW car owners know anything about what makes the wheels go around. But they do pay the gas and oil bills and consequently are always interested in improving economy of operation as much as possible.

One item that affects both fuel and oil economy is worn or poorly fitted valve stems and guides. While this is particularly true on old engines, it is also true to a lesser degree on new engines. The reason for this is that there always must be a certain amount of clearance between the stem and the guide and as each part is manufactured with a certain tolerance,

the clearance of different valves will vary, with the result that the mixture in each cylinder is diluted to a different degree by the air drawn past the valve stem.

With some cylinders receiving a rich mixture and others lean, uneven idling results.

The situation is further complicated by the change in vacuum with different throttle openings. Assuming that the carburetor has been adjusted for idling as accurately as possible, the mixture will be too rich when the throttle is opened, since the vacuum has decreased with the open throttle which in turn results in decreased

air leakage at the valve guides.

The problem of excessive oil consumption as a result of poorly fitted or worn valve guides is probably better known than the uneven idling and poor fuel economy. However, it is also often overlooked.

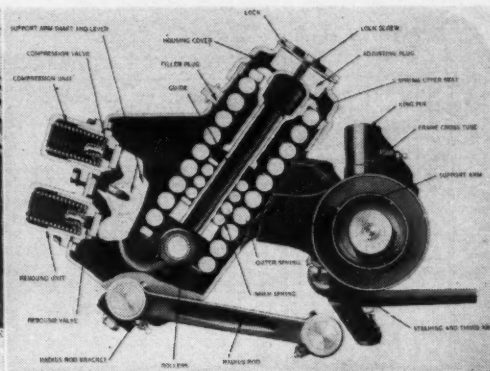
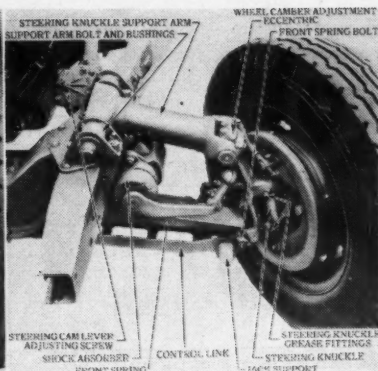
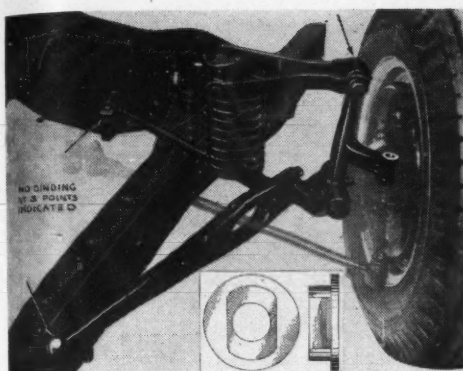
While the leakage can in most instances be cured by the installation of valve packing, in cases of extreme wear, new valves and guides should be installed to insure also proper seating of the valve. As previously indicated, valve packing can be used to advantage on valves before any wear has occurred.

Unfortunately, no method has been developed to measure the amount of air leakage around a valve stem. However, the Wilkening Mfg. Co. has developed a method of measuring the amount of oil leakage.

The method is shown in one of the illustrations. It consists of a valve guide, rigidly mounted on a bracket and in which a valve is reciprocated by connecting the lower end to an eccentric on a small electric motor, the stroke being 5/16 in. At the bottom of the guide there is a small cup through which oil is constantly supplied, so that the lower part of the valve stem works in a bath of oil. The upper part of the guide and the head of the valve are enclosed in a glass tube in which a vacuum is produced. From the lower part of this glass tube, a small rubber tube leads to a test tube in which such oil which may have gone past the guide is collected. This test tube is also under vacuum, so that the oil will drain into it freely.

*(Continued on page 60)*

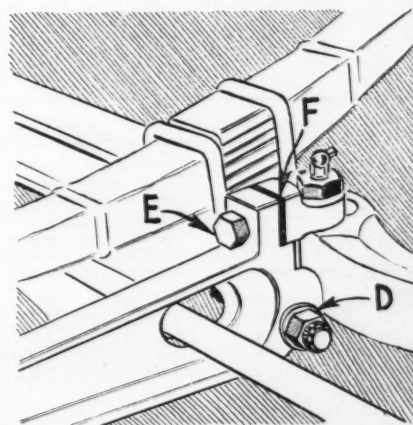
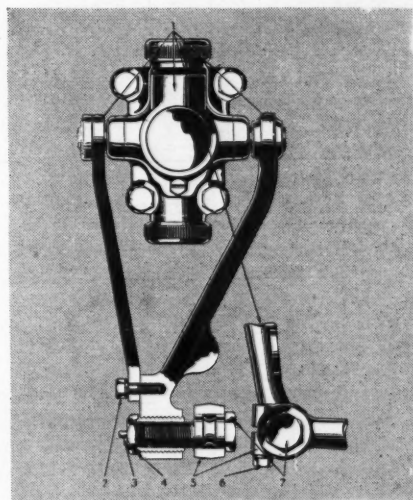
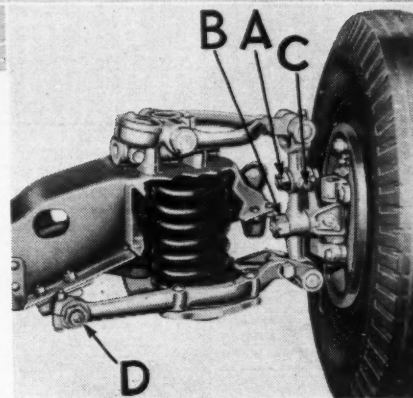




Left, Packard 120, showing camber adjusting eccentric pilots. Center, Studebaker type of suspension. Right, DuBonnet type used on Chevrolet and Pontiac.

# Wheel Alignment Specifications

Compiled for the First Time — Complete  
Caster, Camber and Toe-in Data on Cars  
and Trucks from 1928 to 1936



Reading from the bottom up: Hudson and Terraplane torque arm suspension; Chrysler and DeSoto, showing camber adjusting bolt; Buick parallel link type of suspension.

WHILE a few changes have been made in the construction of independent front wheel suspension systems during the past year these changes present very few new problems to the mechanic insofar as adjusting caster, camber and toe-in is concerned.

Chevrolet and Pontiac still retain the DuBonnet type of construction, which means that camber is not adjustable. Caster can be adjusted by bending the king pin support in the case of Chevrolet, and by installing shims between the cross tube saddles and the frame, in the case of Pontiac.

Other cars in the General Motors line, as well as some models of Chrysler and DeSoto have retained the parallel link type, with slightly simplified construction that tends to make adjustments easier. It is now possible to adjust caster and camber at the same time by one threaded eccentric bolt in the upper control arm on some models, making this a single operation instead of two separate adjustments, as formerly.

Studebaker, with its planar type of construction, has no provision for adjusting caster, but camber

can be adjusted by turning a threaded eccentric bolt in the steering knuckle support arm.

The Packard One-Twenty remains substantially the same as last year, adjusting caster by shims placed at the front end of the torque arm, and adjusting camber by eccentric washers or pilots installed in the shock absorber arm.

Hudson and Terraplane have added torque arms to the conventional axle, thereby relieving the front springs of torque strain, and secure caster adjustment by removing or installing shims at point "F."

Before any attempt is made to check the points of front end alignment, attention should be given to the normal conditions that influence caster, camber, toe-in and turning radius or king pin inclination. First of all, the car must be level. Tires must be inflated to the proper pressure, front wheel bearings must be properly adjusted and the two front springs must be compressed an equal amount. Steering gear adjustment should be checked, and all play removed from tie rod and drag link ball sockets.

# Wheel Alignment Specifications—Passenger Cars and Trucks—1928-1936

FRONT AXLE				FRONT AXLE				FRONT AXLE				FRONT AXLE			
MAKE AND MODEL	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	Kingpin Inclination (Degrees)	MAKE AND MODEL	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	Kingpin Inclination (Degrees)	MAKE AND MODEL	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	Kingpin Inclination (Degrees)	
Auburn 8-101A	1-2E	1-2E	1-2E	7	Dodge DC	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 12-161	1-2E	1-2E	1-2E	7	Dodge DD	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 12-161A	1-2E	1-2E	1-2E	7	Dodge DH	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 8-105	1-2E	1-2E	1-2E	7	Dodge DG	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 12-165	1-2E	1-2E	1-2E	7	Dodge DL	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 1250	1-2E	1-2E	1-2E	7	Dodge DK	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 652T	1-2E	1-2E	1-2E	7	Dodge DP	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 850X	1-2E	1-2E	1-2E	7	Dodge DO	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 850Y	1-2E	1-2E	1-2E	7	Dodge DR	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 853	1-2E	1-2E	1-2E	7	Dodge DU	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 851	1-2E	1-2E	1-2E	7	Dodge DZ	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 854	1-2E	1-2E	1-2E	7	TRUCKS—	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn 852	1-2E	1-2E	1-2E	7	Dodge UF 10	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Auburn SC-852	1-2E	1-2E	1-2E	7	Dodge UF 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Austin	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Austin 375	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 115	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 116	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 121-129	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 50	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 60	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-50	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG 30, 31	1-2E	1-2E	1-2E	7	Lincoln 101-200-V8	1-2E	1-2E	1-2E	7	
Buick 8-40	1-2E	1-2E	1-2E	7	Dodge UG										



**ABBREVIATIONS:**

{ Early Model 40—to Frame No. 2753246-6°	(c) { 2½ SE before Axle No. 3-27619	± Plus or minus	P—Positive	5. Loaded to 600 lbs.
{ Early Model 60—to Frame No. 2752638-7°	(c) { 1-2E after Axle No. 3-27619	E—Empty	— Before Car Serial No. P-116SL	9. Loaded at 800 lbs.
{ Early Model 60—to Frame No. 2758357-7°	(d) { 10¼ before Axle No. 3-77619	L—Loaded	— After Car Serial No. P-116SE	10. Loaded at 450 lbs.
{ Early Model 90—to Frame No. 2755549-7°		N—Negative	— Loaded to 650 lbs.	11. Loaded at 750 lbs.

### ABBREVIATIONS:

# The Readers' Clearing House

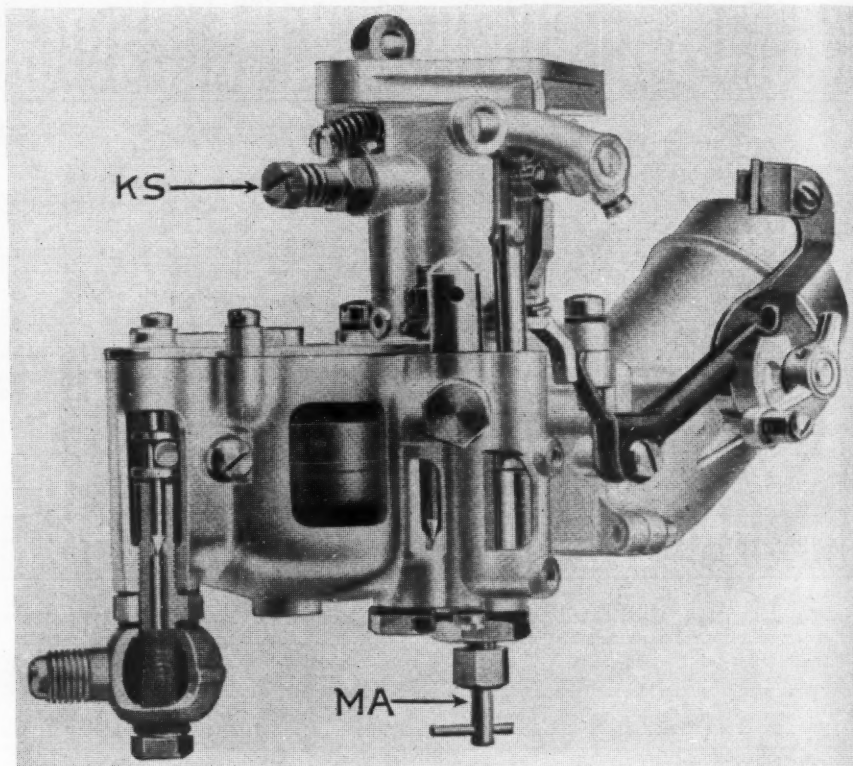
## ENGINE CUTS OUT AT NORMAL SPEED

*I have a Whippet Six 1929 model that only gives about four to six miles to the gallon. If adjusted any leaner it will run fine up to about 40 miles per hour, then shuts down like it is not getting enough gas. I have it set now so it gives about 15 miles per gallon but it gives the above trouble.*

*Could you give me any clue to where the trouble can be found. I have tried two different carburetors with no results, ground the valves and set the tappets to the specified clearance and still no results.*

*I would appreciate any help you can give me. John L. T. Holland, T. C. Reaser & Son., 242 W. 3rd Street, Ashland, Ohio.*

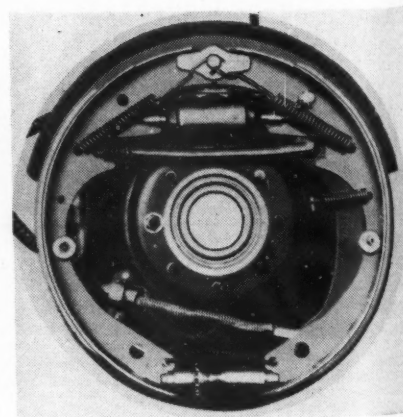
WHILE there are other points besides the carburetor that might be the cause of the difficulty you describe, I think it would be well first to take up the points of adjustment of the carburetor. When first adjusting this carburetor, the main adjusting needle on the bottom of the carburetor should be closed to its seat. Then, open it two complete turns. With the needle in this position, the idle adjusting needle which is on the upper part of the carburetor should be turned in to its seat and then backed out one-half turn. Then start the engine and set the idle stop screw for an engine speed equal to approximately 25 miles per hour. Retard the spark control. With the engine running at this speed, turn in on the main adjusting needle in the bottom of the carburetor until the engine begins to slow down. Then back it out to the point at which the engine appears to run free. Go over this point two or three times to be sure that you stop turning the needle at the right point because this adjustment controls gasoline economy. After you are sure that this adjustment is right, set the throttle stop screw so that the engine will run slightly faster than a normal idling speed. Then, adjust the idle screw by turning it out, or lean until the engine begins to miss. Then turn it in to the point at which the engine picks up and begins to run evenly. This adjustment should be just as lean as it is possible to get it and still have the engine idle smoothly.



Your letter does not mention that you have tested the coil and condenser of this car and I am wondering whether the difficulty might not be experienced at this point and be responsible for cutting out above 40 miles per hour. I would also suggest that you check the valve timing as well as the ignition timing. I am sending you tune-up specifications which will give the correct valve and ignition timing for this car. I would go over this point pretty carefully as it is quite possible that the timing chain has stretched so that the valve timing is enough in error to give you the difficulty you are having.

## INSTRUCTIONS FOR OVERHAULING BRAKES

*Are you able to furnish me with the necessary brake installation and adjustment specifications for the 1935 and 1936 Pontiac six and eight? E. K. Irvine, North Park Garage, 6907 Duncan, Tampa, Fla.*



I AM giving you below instructions for overhauling and adjusting the brakes of the 1935 and 1936 Pontiac.

1—Jack up all four wheels. Remove the front wheels, front hub and drum assemblies, rear wheels and rear drums. Clamp or tie the wheel cylinder pistons in place.

2—Inspect the linings for wear. Clean the brake shoes and drums, re-



## Bill Toboldt

Editor of Motor Age

Continues to answer the ever-increasing number of questions written to the Readers' Clearing House. Robert "Hank" Hankinson, technical editor, lends a helpful hand in conducting this department. These experts invite you to discuss your mechanical problems with them. When writing please use your business letterhead or attach a business card, to indicate your connection with the automotive trade. Name and address will be withheld from publication on request.



moving any foreign particles that may have become embedded in the surface of the linings. Examine the shoes for loose rivets, which must be replaced. Install new shoes or reline if the linings are worn nearly flush with the rivets or if the linings are oil soaked.

Note: Road dirt frequently cuts circumferential grooves in the drums which does not impair the operation of the brakes unless the grooving is extremely severe. When the drums appear to be scored, inspect the linings carefully for embedded metal which must be thoroughly removed and the surfaces of the linings and drums sanded.

3—When replacing shoes, always be certain to assemble the secondary shoes to the rear and the primary shoes to the front. Note that the linings of primary shoes are shorter than the secondary linings.

4—Inspect the rear spring center bolts and replace if they are broken or sheared.

5—Inspect the rear spring U-bolts to see that they are drawn up evenly and just sufficiently tight to bulge the spring-seat insulators at the corners and around the edges of their retainers.

6—Tighten the rear brake cable conduit clamps at the backing plates and frame anchors.

7—Inspect for loose rear backing plate to housing rivet front backing plate hub rivets.

8—Inspect the bushing and thrust washer in the front backing plate hub for wear. Replace the bushing and thrust washer if necessary.

9—Lubricate the brake shoe guides on the backing plates, and on the rear brakes lubricate the parking brake-lever fulcrum, link, and cable ramp. Be sure that too much lubricant is not applied as it may get on the linings. This will result in unequalized brakes and necessitate replacement of linings.

10—When new shoes or linings have been installed, back off the eccentric by turning in the opposite direction to the forward motion of the wheel, using an eccentric nut wrench and eccentric adjuster. Release the adjusting screw, using the adjusting tool to allow the drum to slide freely over the shoes.

11—Install hub and drum assemblies, adjust front wheel bearings and

then proceed with brake adjustment as follows:

1—Make certain that the brake pedal has  $\frac{5}{8}$ -in. clearance between the pedal arm and the underside of the felt retainer.

2—Add sufficient brake fluid in the master cylinder reserve tank to bring the fluid level to within  $\frac{1}{2}$  in. of the top of the filler neck.

3—Disconnect the emergency brake cables at the cross lever.

4—Insert a .010-in. feeler gage between the lining and the drum about  $1\frac{1}{2}$  in. from the adjusting screw end of the secondary (rear) shoe. Loosen the eccentric lock nut slightly, turn the eccentric in the direction the wheel revolves as car moves forward, until a .010-in. feeler is snug.

5—Insert a .010-in. feeler gage about  $1\frac{1}{2}$  in. from anchor pin end of the secondary shoe between the lining and drum. This clearance should be slightly less than that at the adjusting screw end of the secondary shoe. If the clearance is not passable it is necessary to loosen the anchor pin nut and turn the anchor pin in the necessary direction to correct the clearance, at the same time readjusting the eccentric to maintain .010 in. at the adjusting screw end of the secondary shoe. Tighten the eccentric and anchor pin lock nuts.

NOTE: If the clearance at the anchor pin end of the secondary shoe is too great, turn the anchor pin in the direction wheel turns as car moves forward; if too little, turn the anchor pin in the opposite direction. While holding anchor pin with special tool tighten the anchor pin nut as tight as possible with 16-inch wrench. After tightening the anchor pin nut, recheck the clearances.

6—Expand adjusting screw through hole in backing plate with special tool until wheel can just be turned with two hands.

7—Pull the emergency brake lever back from the release stop into the first notch of the ratchet sector; pull the cables toward the cross lever (about 20 lb. pull) to remove all the slack or lost motion; and then adjust the clevises so that clevis pins can just be easily inserted. Lock the clevis jam nuts and install the cotter pins. Release the emergency brake lever.

8—Release the adjusting screw on all four wheels until the first click or notch that brakes are free.

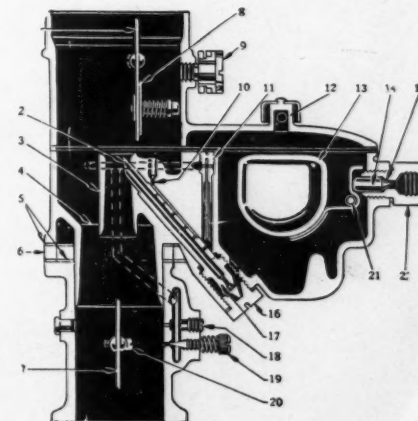
9—Apply the emergency brake and check equalization of the emergency brakes by turning the rear wheels by hand. To equalize, loosen the tightest brake at the adjusting screw.

10—Replace the inspection and adjusting screw hole covers. Be certain that the adjusting screw hole cover is correctly installed. Road test the car.

## CHECK THE FUEL LEVEL TO STOP FLOODING

Will you kindly inform me just what is the cause of an EE-22 Stromberg carburetor, used in a 1934 Chrysler, flooding immediately when motor is stopped? Nathan Duley, Duley's Garage, Plattsburgh, N. Y.

THERE are two frequent causes for the condition you describe and the first and most important one is the matter of fuel level in the carburetor bowl. On the Chrysler models, this fuel level should be  $\frac{9}{16}$  of an inch from the top edge of the



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July, 1936

float bowl and is measured by removing the bowl cover and measuring from the top edge of the bowl down to the gasoline. The level is adjusted by bending the lip on the float arm.

Another cause that has a lot to do with the condition you mention is that the high speed air bleeder may be plugged so that the main discharge tube is not being properly ventilated. The high speed bleeder is a small hole drilled in the carburetor casting just above the main discharge jet and acts as a vent to prevent percolation. Of course, it has an added function of allowing an additional supply of air to be injected into the main discharge tube at high speed to better atomize the gasoline as it is discharged into the venturi. If this air bleeder is plugged, it will have a tendency to cause the gasoline that is in the main discharge tube to percolate and boil out of the tube through the main discharge jet and drop down into the manifold. This will cause stalling and hard starting when the engine is hot.

My suggestion would be that you check the fuel level very carefully and if the customer is using Ethyl treated gasoline that you set the fuel level slightly lower than the 9/16 in. specified. I would also remove the main metering jet and blow out the main discharge tube with air to be sure that the high speed bleeder is free and clean.

Thank you for your letter.

## ALL NEW GEARS BUT TRANS. STILL NOISY

*We are having trouble with a noise in a 1929 Model A Ford transmission. Have put in all new parts in this transmission except idler gear and low and reverse sliding gear but it is still noisy, and we are wondering if this noise could be caused by misalignment of main shaft and/or pilot shaft? The noise seems to be more pronounced in second gear. This car has been driven 76,000 miles but is in good condition.*

*Do you think a bad bearing in the rear end or on the driveshaft could cause this "whining" noise? An Oregon subscriber.*

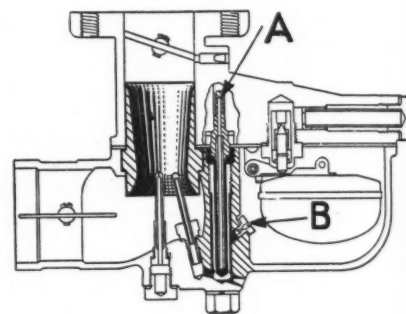
I AM inclined to suspect the transmission main shaft pilot bearing of being the cause of the noise. This seems to be borne out by the fact that the noise disappeared when driving in high gear. It does not seem possible that you would get enough noise from the reverse idler gear even though it is running with a new cluster gear. Quite often the mating of new gears with old ones produces noise, but with the transmission in neutral position, the reverse idler gear is the only gear that is turning against a new gear. You know, of course, that it quite often happens that new gears will be noisy when they are first installed, but they usually become quiet after a few thousand miles of operation.

You mention the possibility of this noise being caused by the main shaft being out-of-line or the main drive gear shaft being sprung. This condition would, of course, give you a noise similar to that described. But, in view of the fact that your letter states that all new parts were put in with the exception of the reverse idler gear and the low and reverse sliding gear, it does not seem likely that these shafts would be out-of-line.

## CHECK THE CARBURETOR WHEN ENGINE STALLS

*I have a Model A Ford, 1930, that is causing me a headache. The motor will not idle more than two minutes. It will idle good for a few seconds then the motor will start to buck and vibrate the whole car.*

*I have installed good rings, new valves and guides, new coil, new condenser, new points, new distributor shaft, new carburetor and I have changed the timing to different posi-*

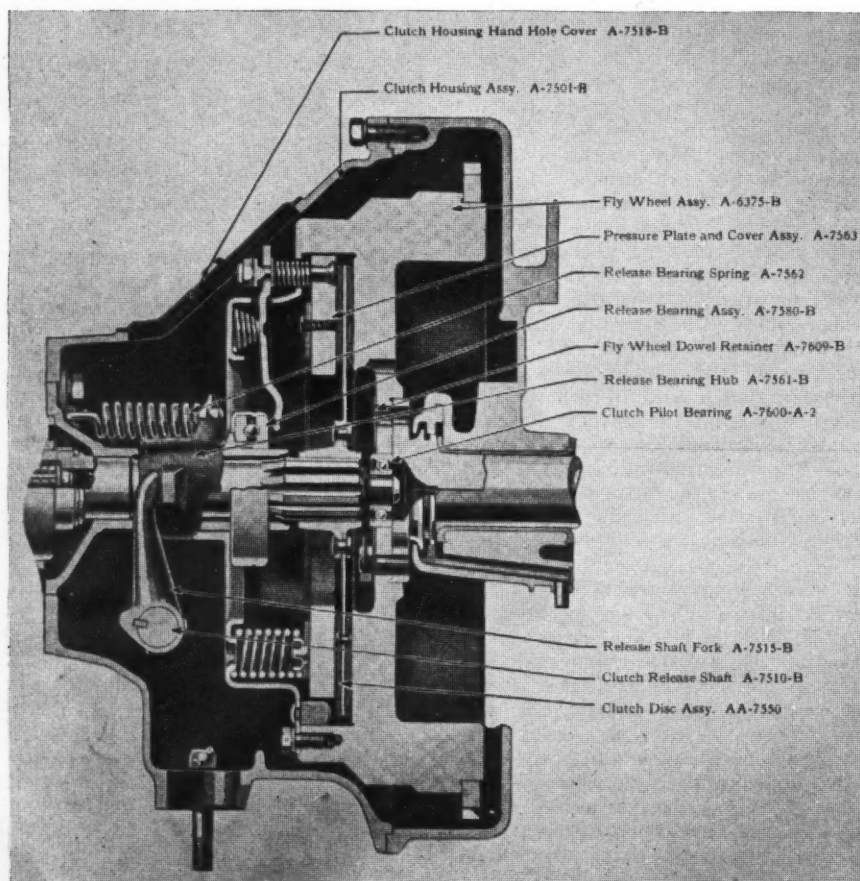


*tions. I haven't touched the timing gears because they do not rattle.*

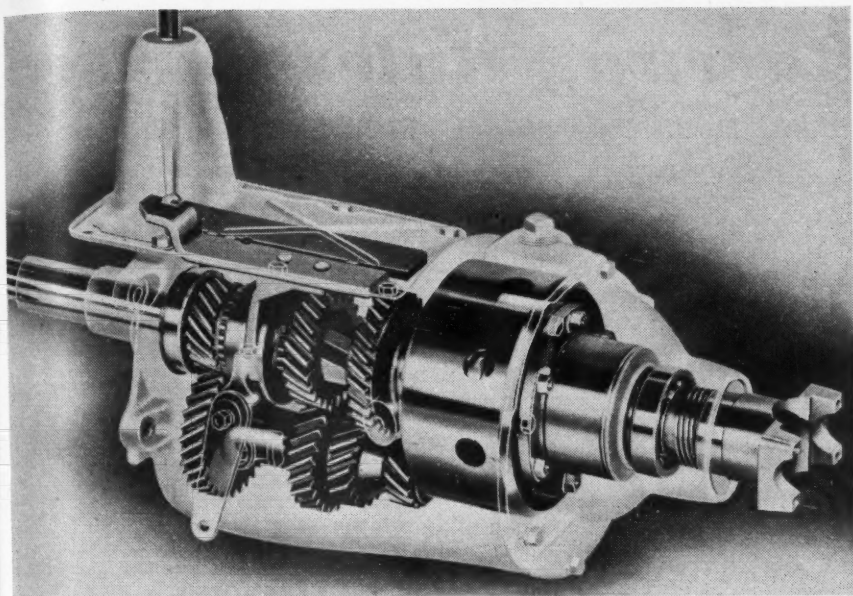
*The man is well pleased the way the car runs and pulls but it will not idle. It is considered to be the best pulling Ford around here. Mike Zarembo, Johnsonburg, N. J.*

EVEN though the carburetor on this car is a new one, I would suggest that you lower the float level as your description of the trouble seems to indicate that the engine is loading up at idling speed. I assume that you have already checked the points and that they are set between 0.018 and 0.022 and that the spark plug gaps are spaced at 0.027 in. if the car has a standard compression head, or at 0.035 in. if the car has a high compression head.

As you no doubt know, a change was made in the carburetor from a double to a single venturi which necessitated changing the jets. If you are not sure, I would suggest that you check particularly the idling jet "A" to be sure that it is stamped eleven (11) and that the compensator jet "B" is stamped nineteen (19). While you are checking these points, it would be well to be sure that the idle jet and particularly the compensator jet are clean. If the compensator jet is partially clogged or is damaged in any way, it would result in poor idling performance.







## Overdrive Versus Direct Drive

We will very much appreciate your opinion on the following question. Will any automobile which incorporates an overdrive in the gear mechanism travel at 60 miles per hour in overdrive on the same amount of gasoline as is required at 40 miles per hour in conventional high gear? The question is not (does an overdrive save gasoline) but exactly as stated above. Considerable local discussion brought about our asking the Readers' Clearing House. An Oregon Subscriber.

**M**UCH would depend on the ratio of overdrive to direct drive in determining the speed at which the engine operates in relation to the speed at which the car is traveling either in direct or in overdrive. Then, too, wind resistance increases greatly at higher speeds and, of course, would require more power to overcome at 60 miles per hour than it would at 40 miles per hour. Of course, if you want to eliminate wind resistance and the other factors that influence gasoline consumption, you can arrive at a theoretical answer to your question which, however, would not hold exactly true in actual practice.

Let us take, for example, a 1936 Studebaker Dictator which can be furnished with an overdrive transmission. This overdrive has a ratio of .705 revolutions of the main shaft to 1 revolution of the propeller shaft. The car is equipped with a 4.55 to 1 rear axle ratio and uses a 16 by 6.00 tire. At 60 miles per hour in direct drive the engine is turning over approximately 3240 r.p.m. At 40 miles per hour the engine is turning over approximately 2160 r.p.m. in direct drive. With the overdrive in operation and considering the tire size, rear axle ratio and the overdrive ratio, the engine at 60 miles per hour

is turning over approximately 2280 revolutions per minute. You will note from the above that the engine revolutions with the overdrive in operation at 60 miles per hour are approximately 120 revolutions per minute more than at 40 miles per hour in direct drive. Therefore, instead of representing a speed of 40 miles per hour, the above engine r.p.m. of 2280 would represent a car speed of 41.9 miles per hour in direct drive. Therefore, you will see that the overdrive transmission has the effect of reducing the engine revolutions 960 revolutions per minute at 60 miles per hour.

Getting back to your question, it seems to me that if it were possible to disregard wind resistance, bearing loads and rolling friction and all other factors that would enter into this case, you should expect to receive the same gasoline consumption at 60 miles per hour driving through the overdrive unit with the engine turning over at a 40 or 42 mile-an-hour rate as you would receive if you were driving at 40 or 42 miles per hour in direct drive.

Carburetors are so calibrated that usually the best economy is experienced at throttle openings that normally drive the car somewhere between 30 and 40 miles per hour in direct drive and, therefore, if the engine is operating within that range you should experience practically the same gasoline consumption regardless of the speed at which the car might be moving.

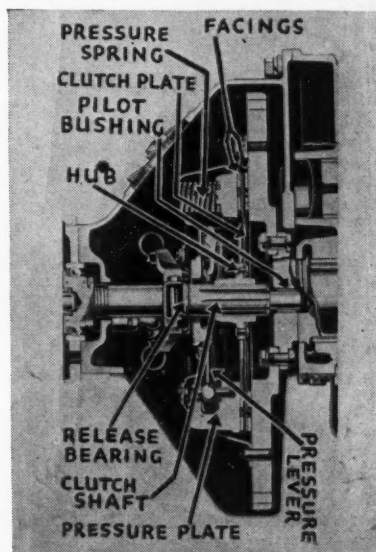
You realize, of course, that this is a theoretical answer and would not hold true in actual operation, due to overcoming the resistance of the factors mentioned above. The question of whether the gasoline saved by the reduced engine r.p.m. would be used in overcoming these resistance factors is another question, and one that

could not be answered except by actual tests. However, I hope that the above has given you the information you desire and will help you in your discussion of this subject.

## CLUTCH SQUEALS WHEN ENGINE IS COLD

I have a customer who owns a 1932 Model F Oldsmobile six. When the motor is cold and the clutch released to start the car or change gears, it squeals so loud it can be heard for blocks. After it has been run about 25 miles the squeal will disappear until the motor is cold again.

We installed a new clutch pressure plate, driving disk and release bearing but the squeal is just as bad as before the new parts were installed. Will you kindly advise me the cause of this squeal and the cure? George G. Barrick, 30½ Main Street, Flemington, N. J.



**I** AM inclined to believe that this noise is coming from the clutch pilot bushing which is located in the rear end of the crankshaft. My suggestion would be that you replace this bushing with a new one and I believe the noise will be eliminated.

**W**HEN draining the oil from the engine of the Graham Supercharger models, observe if the oil is badly discolored. If it is, it indicates that the Fram Oil Cleaner is not operating properly. This may be due to two conditions; dirt in the tee connection on the side of the cleaner, or the tube running from the tee connection to the oil gage may be inserted too far into the tee, blocking the cross hole leading to the filter. Remove the tee connection and be sure that it is clean, and that there is no obstruction in the cross hole. If the tube is inserted too far, cut it off at a point that will permit the end of the tube to come above the cross hole in the fitting.

# Raceway Rules Revised

Riding Mechanics Optional—Field Cut to 36 Entrants—  
Hand Crank O.K.—In A.A.A. Announcement

The AAA Contest Board will allow riding mechanics to take part in the First Annual 400-Mile International Sweepstakes at Roosevelt Raceway, Westbury, Long Island, October 12.

The approval of the extra man in the entry cars rescinds the original

order barring riding mechanics. However, whether a mechanic rides is left to the decision of the driver of the car, for the new rule does not make it compulsory for any driver to carry a "passenger" in view of the fact that both the single seater and the big two-man cars are eligible.

At the same time, the Contest Board cut the starting field from 45 cars to 36, with the proviso that the list may be increased before race day. This move was agreed upon because of the uniqueness of the four-mile course which winds its way through 15 difficult curves and 20 straightaways. At Indianapolis, where the speed stars go "round and round" two and one-half miles each lap for 200 laps to complete the annual 500 miles, the starting field is 33 cars and once was 45.

Another departure from the original entry blank, recently distributed, okehs the use of a hand crank, thus indicating the influx of foreign entries. In Europe car construction types do not permit installation of an electric starter, for years compulsory equipment at Indianapolis. The original ruling for Roosevelt Field also made the electric starter compulsory equipment, but the revision discards this angle.

The new racing course became an actuality on June 12 when ground was broken.

Contractors in charge of the construction promise Motor Development Corporation of N. Y., backers of the project, that the new track will be completed by September 1 and the organizers have planned practice periods for entrants shortly thereafter.

## Three-millionth V-8

The 3,000,000th V-8 Ford came off the famous final assembly line at the Rouge Plant of the Ford Motor Company this morning under the eyes of Henry Ford and Edsel Ford and a group of British cement manufacturers headed by Viscount Wolmer.

The car will remain on display for a few days after which it will be started overland to Dallas for exhibition during the summer in the Ford Exposition Building at the Texas Centennial Exposition.

The 3,000,000th V-8 unit was the one-millionth Ford to be built since June 13, 1935, a year less 18 days. It added one more unit to the more than 24,000,000 Fords which have been built since the Ford Motor Company was established June 16, 1903. The 25,000,000th Ford will be built early in 1937.

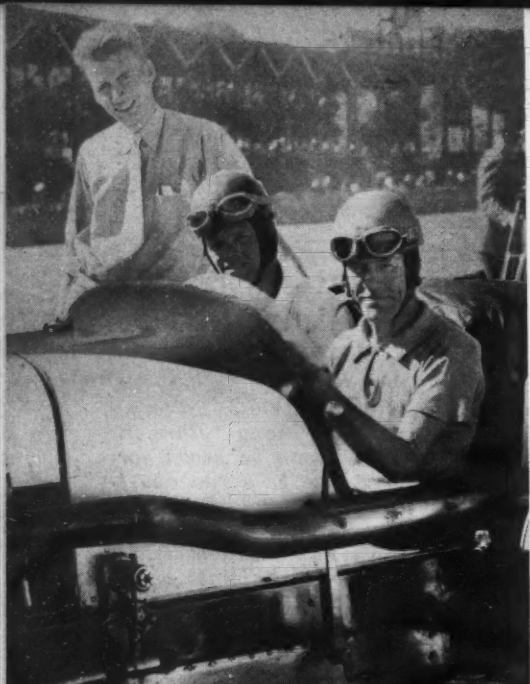
## Attends Opening of Exposition

Representing the National Conference of Business Paper Editors of which Motor AGE is a member, Miss Ruth Harrington attended the opening of the Texas Exposition June 6 as the guest of the Chrysler Corporation and the Neiman-Marcus Store of Dallas.

## The Automobile

I am speed made subject to human will. I give mankind dominion over distance. I open the avenues of all the world to humanity. I enlarge the radius of human life. I expand the horizon of human opportunity. I give to man a locomotive as rapid and as subtle as his desire. I give to his body the speed and mobility of his ambition. I promote peace and good fellowship in the human race, for I have bridged the spaces that kept men isolated and ignorant of each other. I hurry the master minds of the world to conference places where the destinies of nations are determined. I snatch the dying from the scythe of death and outrun him a thousand times a day. I am the silent partner in all the business houses of the world. I save hours out of man's work-day and give them to him to play with. I make man free of all the farplaces of venture, recreation and delight. I am the most capable and constant servant in the homes of men. I bear the sick swiftly and gently out to nature whose touch puts the roses into cheeks fatigue has faded. I take men from their stifling cities of steel and stone out to the murmuring streams and windswept meadows. I give supremacy of locomotion to man whom nature made slower than the beasts. I am individual transportation free of all laborious limitations. . . . I am the Automobile.—John O. Munn.

**F**ATHER and son, driver and mechanic at Indianapolis. (top of column) Zeke Meyer and his son Charlie, who rode with him in the recent 500-mile race. (middle of column) Nuvolari, winner of the recent Barcelona, Spain "Grand Prix" automobile race. He drove an "Alfa-Romeo" car. (bottom) Repairman-artist W. F. Ahrens, owner of the West Side Garage, Fredonia, N. Y., whose hobby is portrait painting.





## Tire Industry Proposed Code Before F. T. C.

The Federal Trade Commission is expected soon to project a code of ethics for tire manufacturers and marketers, based upon the 15 proposed fair trade rules submitted to it at the industry's trade practice conference held June 4 in Chicago. Such rules as the Commission may accept and promulgate will be divided into two groups—one consisting of rules, violation of which could be punishable by law and in which cases the Commission would proceed against the violators; and the other of rules voluntarily obeyed by the industry, without recourse to law in event of violation.

Commissioner R. E. Freer presided at the industry's conference which was sponsored by the National Association of Independent Tire Dealers. The 15 proposed rules would declare the following practices as unfair competition:

1—Price discrimination between purchasers where the effect might be to lessen competition in restraint of trade, or might tend to create monopoly.

2—Defamation of competitors.

3—Selling below cost.

4—Deceptive guarantees; misrepresentation in advertising.

5—False or deceptive marking or branding of products for the purpose of misleading customers with respect to grade, quality, etc.

6—Claiming to be "an authorized dealer" when such may not be the case.

7—Advertising or representing the handling of "all standard makes" when such is not the case.

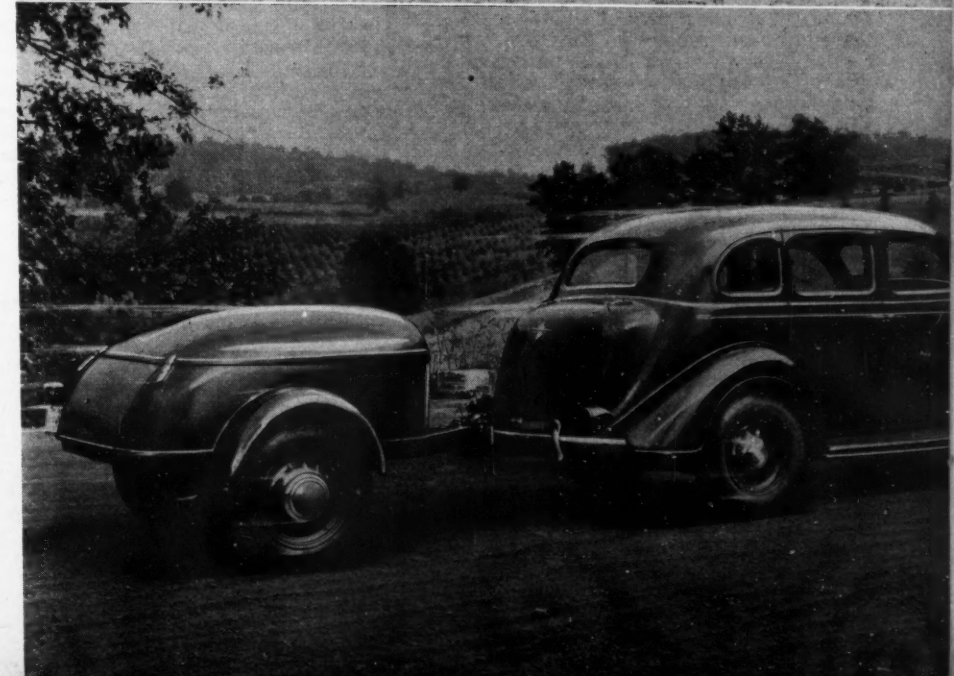
8—Falsely representing in the sale, or offering for sale, of change-over tires and tubes that such tires or tubes are new and unused.

9—Secret payment of allowances, rebates or refunds, commissions or unearned discounts or secretly extending to certain purchasers special privileges not extended to all purchasers under like conditions and terms.

10—Withholding from, or inserting in, the invoice or sale ticket, statements which make the invoice or sales ticket a false record, wholly or in part of the transaction represented on the face thereof.

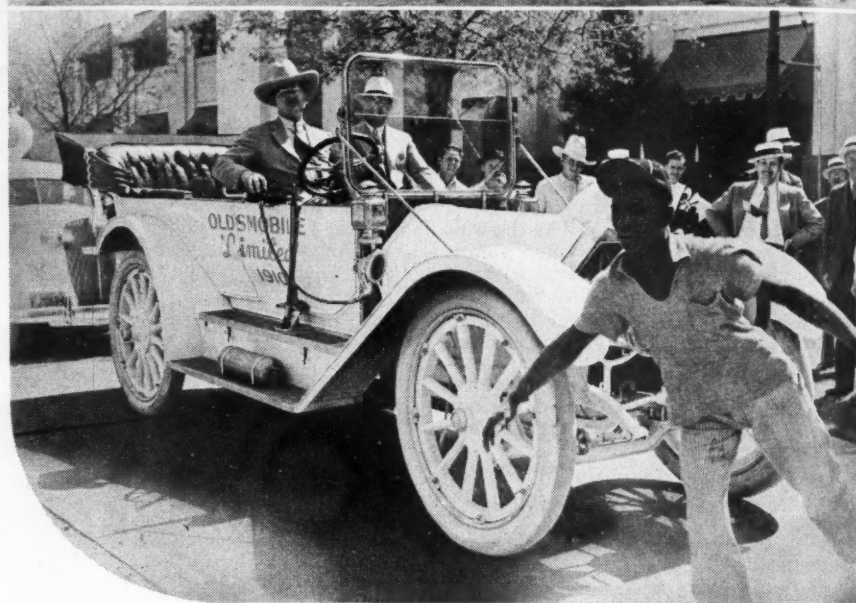
(Continued on page 42)

**JACK DEMPSEY** (top of column) shows his punch to **W. S. Knudsen**, executive vice-president of General Motors as **M. E. Coyle**, president of Chevrolet looks on. (middle) Ground broken for Roosevelt Raceway. **Kermit Roosevelt**, son of Teddy, wields the spade, as "**Casey**" **Jones**, **George Marshall** and **Lou Meyer** watch the beginning of the new auto speedway. (bottom) A new all-steel trailer, to sell in the low price range, announced by the **Mullins Mfg. Corp.**, **Salem, O.**





**A** MODERN service car, owned by H. M. Sterner of Hanover, Pa. (Above) It is equipped with a Manley Double Boom Crane. (Upper Right) This midget car is used by an ice cream vendor in New Haven, Conn. (Right) Walter Woodul, Lieutenant Governor of Texas, driving D. E. Ralston, Oldsmobile vice-president and general sales manager in an Oldsmobile Limited built in 1910. This car was one of Oldsmobile's Good Will Caravan driven to the Texas Centennial Exposition at Dallas.



## Tire Industry Code

### Before F. T. C.

(Continued from page 41)

11—Advertising recapped, rebilt or retreaded tires as new or unused tires.

12—Failing to differentiate between wholesale and retail merchandise, when both are sold in the same establishment.

13—Extending to any individual, firm or corporation cost consideration lower than to the retail tire dealer whose principal purpose is for resale.

14—Failure to brand product on sidewall with name of manufacturer and trade name of tire whether first, second, third, fourth or fifth line, and whether four or six ply. All special brand tires to be branded in accordance with nearest corresponding line of tires produced by the manufacturer thereof.

15—Guaranteeing prices for more than 30 days.

Proposed rule No. 1 is based upon the recent Federal Trade Commission decision in the Goodyear-Sears Roebuck case, the Commission having found Goodyear guilty of illegal price discrimination under the Clayton Act.

Proposed rule No. 15 is patterned after the application for complaint, now before the Commission, as sponsored by the N.A.I.T.D.

## New Diamond T Truck

A new three-quarter ton truck, the Model 80, has been announced by the Diamond T Motor Car Co. The Model 80 standard chassis has a wheelbase of 119 in. The rear axle is of full floating design, with a spiral bevel drive and a standard ratio of 4.5 to 1. A ratio of 5.1 to 1 is also available.

The truck is powered by a six-cylinder engine, having a bore of 3½ in. and stroke of 4½ in. The rated hp. is 23.44 and the piston displacement 190 cu. in.

The standard chassis is priced at \$525 and the de luxe model, \$568.

## Toboldt Speaks At Big Allentown, Pa., Meeting

Nearly a hundred attended the June 22 meeting of the Master Automotive Repairmen's Assn. at Allentown, Pa. "Bill" Toboldt, editor of MOTOR AGE, as guest speaker, gave another of his practical talks on Management and Methods in the Modern Maintenance Shop. J. C. Noll is president of the Master Repairmen and H. S. Miller is secretary. These men headed the group at the Allentown meeting.

C. G. Loose, president of the Berks County (Pa.) Automotive Maintenance Assn., together with other officials and board members of that association, were present at the meeting. They presented a draft of a proposed bill for licensing repair shops and mechanics in the state of Pennsylvania. The draft was read at the meeting and members of the Master Automotive Repairmen's Assn. were urged to support it.

## Repairman Converts Cars To Fuel Oil Burners

George D. Bolton and Harold Garrett of the Riverside Garage, Miami, Fla., converted seven Model A Fords to operate on fuel oil for the Miami Beach patrol. More recently Mr. Bolton installed an oil burner on a 1932 Chevrolet sedan. He also made a complete installation on a DeVaux 675. This was a "refined" job but essen-

tially the same as used on the Model A patrol cars.

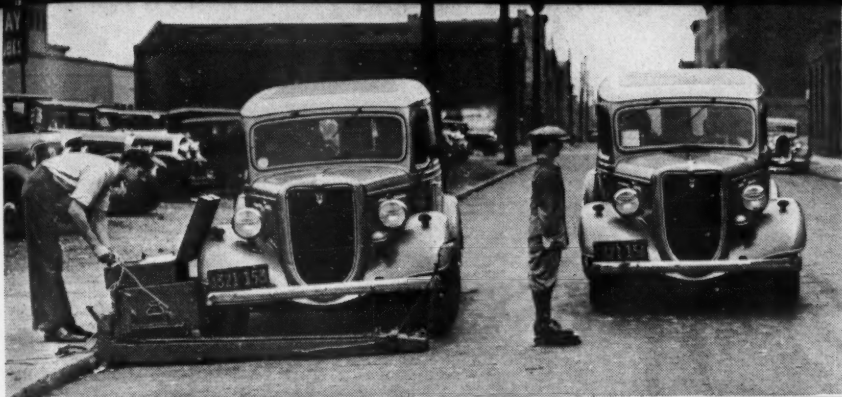
From a two-gallon oil tank above the engine on the dash, a feed line ran to the three-way valve at the stock carburetor. Intake and exhaust manifolds were wrapped with asbestos. Mr. Bolton said that when the intake and exhaust manifolds get "350 degrees hot" the valve is switched from gasoline to fuel oil, "and the motor keeps right on going the same as when operated on gasoline."

"The installation uses No. 2 grade fuel oil, kerosene or gasoline," Bolton declared. "You get a third more mileage with kerosene and a fourth more with fuel oil. With gasoline, the DeVaux gave 20 miles a gallon. Fuel oil gives 35 miles a gallon."

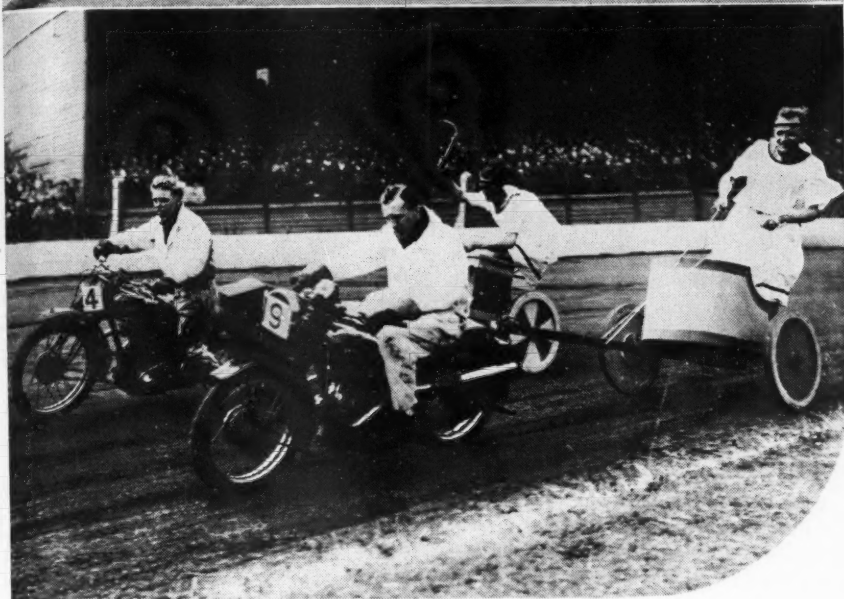


Denominations of 6 and 12 Pfennigs, carrying the pictures of Daimler and Benz, are included in a recent stamp issue commemorating the 50th anniversary of the advent of the gasoline automobile in Germany.





**WALLY BEERY** (above) film star, and his daughter, Carol Ann Beery with the new specially designed Ford V-8 bus which will be used for his vacation trips. (Upper Left) A dummy of a boy darts out without warning, in front of an oncoming automobile, during experiments by Brooklyn Edison Company's Safety crew in training company drivers. (Left) A novelty feature at recent British automobile races was this Roman Chariot Race in which motorcycles took the place of horses.



### Repairmen-Boosters Outing

Philadelphia repairmen, jobbers' and manufacturers' representatives enjoyed the fifteenth annual outing planned for them by the Automotive Service Assn. of Phila. and the Booster Club No. 18. The affair took place at the Oak Terrace Country Club, Ambler, Pa., and a complete program of sporting events and entertainment was presented. More than two hundred prizes were awarded to winners in sporting events and as "door gifts."

The general committee included: For the Servicemen—Aug. Wilkening, chairman; Gordon S. Davis, vice-chairman; Andy Ahrens, Bill Cadle, Joe Dawson, Jack Graham, Fred Hendler, Ellwood Kieser, Earl Mylecraine, Fred Nicholson, Bill Nock, Jack Palmer, Lou Pearl, Nels Redding, Mike Shapiro, Frank Whitman.

For the Boosters—C. Harry Walz, chairman; Chas. B. Solly, vice-chairman; Buck Bucklin, Bill Cadle, Bud Clime, "Murphy" Cohen, Eric Feder-schmidt, Joe Feeney, Fred Isenberg, Jack Kuhn, Jack Maerz, Harry Nicholson, Jim O'Hara, Fred Raymond, Howard Smith, Larry Strasburger.

### LaCrosse Has Line Of Motor Lubricant Aids

LaCrosse Motor Aid Corp., LaCrosse, Wis., manufactures lubricants that are claimed to be of use in preventing engine wear and in assisting the mechanic in his work.

Gas-Aid is a product added to regular gasoline and is said to prevent sticking valves. Motor-Aid Carbon Remover, when 1 oz. is inserted in the spark plug hole, is said to remove carbon deposits.

Lube-Aid, when added to engine oil, is said to increase the film strength and increase bearing life. Mechanics'-Aid Penetrating Oil is said to loosen up rusty bolts and nuts, free up tight door hinge pins, and for use wherever penetrating oil is required.

### GM, Ford and Chrysler Exhibits at Texas

The big three of the motor world were very much in evidence as the gates of the Texas Centennial Exposition at Dallas opened early this month. The interior of the Chrysler exhibit, featuring a background of sea blue mirrors, is one of the most beautiful at the fair. The "mechanical man," made entirely from automobile parts, is a feature of the exhibit, and makes comments on those who pass by. Two marionette shows, one presenting the Chrysler sales story complete with miniature cars, the other featuring a novel fashion show, are other attractions.

The Ford building, constructed of steel, concrete and sheet rock, is placed between the Federal building and the Court of Honor and houses 55,000 sq. ft. of exhibition space. The giant display of raw materials from the Southwest which are used in the production of Ford cars forms the chief attraction here. Sulphur is among the products not usually associated with motor cars and which is drawing much attention from the crowds.

The General Motors Auditorium, as the G.M. exhibit is known, features leather decorations with walls in shades of brown and blue. Several of the cars on the floor are finished in "Blue Bonnet" blue in tribute to the State flower of Texas. The General Motors safety car with small metal panels which shoot out to illustrate safety features, and Chief Pontiac,

Indian robot, are the outstanding attractions.

It is reported that the opening day gate record was almost up to the Chicago mark, and that attendance to date has far exceeded expectations.

### G. E. Offers New Handy Floodlights

The General Electric Co., Schenectady, N. Y., has announced two new floodlights, the Junior Handy, Type AL-35, for 100 to 150 Watts, and the Senior Handy, Type AL-36, for 200 Watts. Both lights are finished in green, and lenses of clear glass, red, blue, green or amber are available. Base and stand is of the swivel type, and the light is of the internal fixed focus type. The Junior Handy has an 8-inch diameter lens, while the Senior Handy has a 10-inch diameter lens.

### Correction on Litz Withdrawal

The technical observer's original report on the cause of the withdrawal in the 170th lap of the Litz Special, driven by Deacon Litz in the Indianapolis 500-mile race has been declared incorrect by the American Automobile Association. The actual cause of the trouble was a broken crankcase and timing gear housing, according to latest advices from the A.A.A.



**L**ANDS in a parking lot. (Top) A daring airman thrilled members of Congress recently when he dropped his wingless autogiro in a small parking space at the east plaza of the Capitol building. (Above) Winner of trophy in model airplane contest. Maxwell Basset (right) receives a gold trophy and a Forster Bros. engine from Mr. Forster (left), in the First International Gas Model Airplane Contest at Hadley Field, N. J.

### **Chevrolet Buys Durant Oakland, Calif., Plant**

The Chevrolet Motor Co. has purchased the former Durant plant at Oakland, Cal., says an announcement by M. E. Coyle, president and general manager of Chevrolet.

"Our present assembly facilities at Oakland have proved inadequate to

meet the demand for Chevrolet passenger cars and trucks," said Mr. Coyle. "We have, therefore, acquired this additional plant, which contains 315,000 sq. ft. of floor space. By Jan. 1, 1937, Chevrolet will have completed necessary rearrangements in both Oakland plants and will then operate them as one unit. Both passenger car and truck capacity will be

increased when the new plant goes into operation."

The purchase of this plant will increase the number of Chevrolet assembly plants to 11 and the total number of Chevrolet manufacturing and assembly plants to 24.

### **Open Service School**

Tarbell-Watters Co. of Springfield, Mass., wholesale and retail automobile parts dealers, inaugurated a weekly service school for local foremen and mechanics last month. The initial session was attended by 125 men from the trade. The course of instructions deals with the servicing of the modern cars with special emphasis on the 1936 models of the various manufacturers. George H. Curtis of the Allen Electric and Manufacturing Company is the instructor.

### **New Bantam Line to Come From Old Austin Factory**

Officials of the Bantam Car Co., Butler, Pa., owner of the defunct American Austin Car Co., have announced reorganization and plans for the production of improved models of the "Bantam" to include a small commercial truck and a line of two-passenger cars.

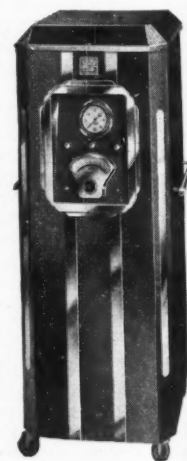
Roy S. Evans, formerly of Atlanta, Ga., is president of the company, and has been in Butler since the purchase made at a trustee's sale last August. Harry A. Miller, famed for his racing motors, is vice-president in charge of engineering. Vice-president in charge of body engineering is Thomas L. Hibbard, formerly of Hibbard and Darin, custom body builders in Paris, and of General Motors. Peter Beasley of the Detroit Aircraft Corp. is secretary of the company and Martin Tow is treasurer.

Mr. Evans has announced that production will start within 90 days and that the company will have a capacity of 5000 cars a year. The price range will be from \$295 to \$345 F.O.B. the factory.

### **Stromberg Exhaust Analyst Introduces New Features**

The Stromberg Motoscope Corp., Chicago, Ill., has announced an exhaust analyzer in which the instrument unit can be removed from the cabinet and placed inside the car, so that tests under actual operating conditions can be made.

The cabinet stands 52 inches high, and is finished in blue and red, with chromium trim. The panel is illuminated. Stromberg claims an entirely new method of analyzing exhaust gases, and a positive and quick indication on the electrical meter that is of exclusive Stromberg manufacture.





As

# Thousands Cheer . . .

## Pontiac Dealers Turn Goodwill into Sales

PONTIAC dealers started the spring with the best April sales since 1929. Their sales for the next month produced the third highest May in Pontiac's history. And the first 10 days of June (the latest report available) have produced total sales greater than the first 10 days of May! *Pontiac is going places at a constantly increasing speed.*

These sales figures tell a great story. But the story behind them is more encouraging still. It is contained in the thousands of letters written by owners praising Pontiac cars and Pontiac dealers in the most enthusiastic terms. The future is bright for Pontiac and Pontiac dealers because, as these letters prove,

the power behind this great drive toward leadership is supplied by the public themselves. They have *confidence* in Pontiac products and dealers, and *all sales start from confidence.*

Because Pontiac dealers have recognized this truth they are reaping rich rewards. And their fine attitude has brought about another interesting result. The new dealers added to the Pontiac organization from time to time are entirely relieved of the necessity of building public acceptance for themselves and their merchandise. *They can start immediately to turn goodwill into sales.*

PONTIAC MOTOR COMPANY, PONTIAC, MICHIGAN

"The confidence I had in the integrity of your dealer was what prompted me to buy a Pontiac. He has been courteous, attentive, and has done all in his power to make the transaction pleasant and satisfactory."  
J.B.B., Canton, Miss.\*

"Your dealer has the finest mechanics and equipment available. I take pleasure in giving him this boost."  
A.B., Springfield, Mass.\*

"Have had several deals with your dealer and always found him as fair and square as anyone could wish for. My future deals for cars will be with him and the cars will be Pontiacs."  
F.M.D., Syracuse, N. Y.\*

"I wish we had more men like your dealer here. He is one of the finest and fairest men I ever knew."  
A.L.L., Albemarle, N. C.\*

"Your dealer is the cleanest dealing, most honest business man I have ever known. You should be proud of him."  
G.E.C., Champaign, Ill.\*

"I have never had such excellent service or been as well pleased by any other service department as I have been by your dealer. Their treatment has pleased me greatly."  
A.B., Portland, Ore.\*

"Have bought seven cars in all from your dealer and, aside from the fact that I like Pontiacs, I can give the reason in just two words—'perfect service'.  
F.M., Des Moines, Iowa\*

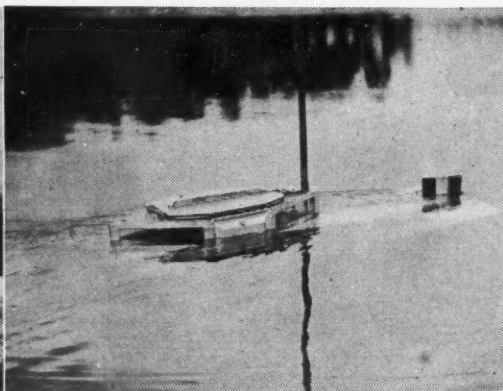
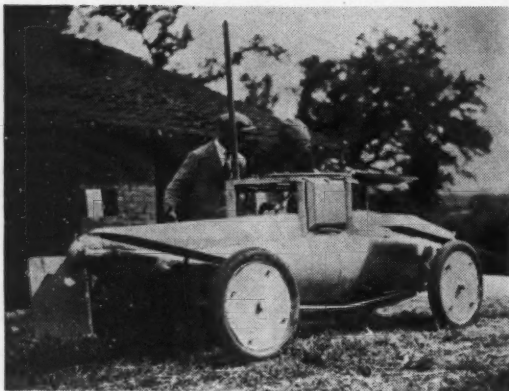
"Your dealer is an exceptional person, we all feel. A gentleman of integrity, in whom we have confidence, interested, helpful and a pleasure to deal with."  
L.M., Los Angeles, Calif.\*

\*Excerpt from a letter on file at the Pontiac Motor Company.

*If you are interested in acquiring the Pontiac franchise, please communicate with C. P. Simpson, Vice-President and General Sales Manager, Pontiac Motor Company. Your communication will be regarded as strictly confidential.*



**Pontiac**  
DIVISION OF GENERAL MOTORS



**A** SUBMARINE motor car, developed by Michel Andre of France. It is said that the machine can travel on the road at 25 km. p. h., on and under water at 10 km. p. h. (On the right) A view of the straight stretch on the dangerous Gavea Circuit, raceway, near Rio de Janeiro, Brazil.



**HENRY FORD**, with Colonel S. D. Smith as they walked in the commencement procession at Michigan State College, where Mr. Ford received an honorary degree of Doctor of Engineering, last month.

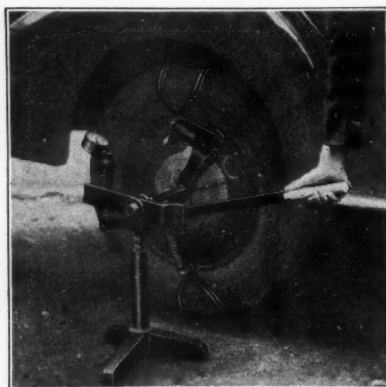
#### **Buckendale Named Engineering Vice-President of Timken-Detroit**

L. R. Buckendale has been elected vice-president in charge of engineering of the Timken Detroit Axle Co. Mr. Buckendale has been executive engineer of the company for a number of years.

Walter F. Rockwell has been elected secretary and A. I. Hawkins treasurer of the company, succeeding W. C. Wood, former secretary-treasurer, resigned. Mr. Rockwell is also a vice-president of the company and Mr. Hawkins was formerly assistant to the vice-president.

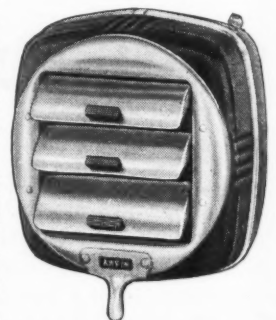
#### **Stromberg Brake Equalizer**

The Stromberg Motoscope Corp., Chicago, Ill., has recently announced a brake equalizer which is said to be easy to operate, requiring only one mechanic. The indicating gage is hydraulically operated, assuring accurate reading. The equalizer is self-adjusting to all tire sizes, and tests right and left side brakes without interference from skirted fenders. Price, \$32.50, f.o.b. Chicago.



#### **Arvin Announces Four Heaters for 1937 Line**

Noblitt-Sparks Industries, Inc., Columbus, Ind., makers of Arvin Hot Water Car Heaters, has announced a new line of High Temperature Series "E" Heaters for the 1936-37 season.



The new line is said to consist of four types, ranging in price from \$9.95 to \$19.95. They are finished in an attractive new taupe, with chromium trim. Scientifically designed copper radiator cores are said to provide better heat radiation, and the heavy duty, variable speed motor is said to be quiet and self-oiling. All models have the exclusive Arvin full-turn chromium deflector front.

#### **Reo Streamlines Trucks**

A completely new line of 3 to 5 and 4 to 6 ton heavy duty trucks has been announced by officials of the Reo Motor Car Co., Lansing, Mich. Base chassis prices range from \$1745 and up for the 3-5 ton models and \$2775 up for the 4-6 ton units.

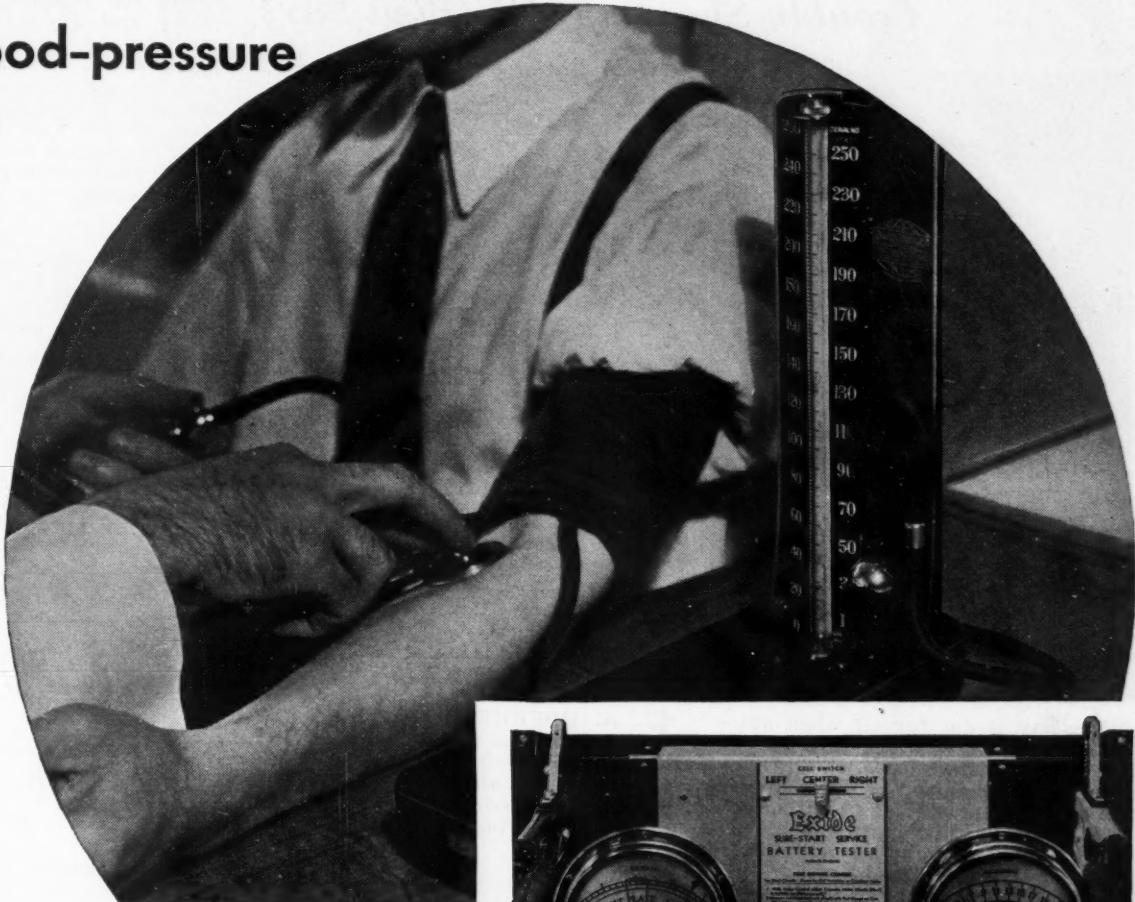
## **Gasoline Consumption at Indianapolis**

### **Fuel Figures on First Ten Cars**

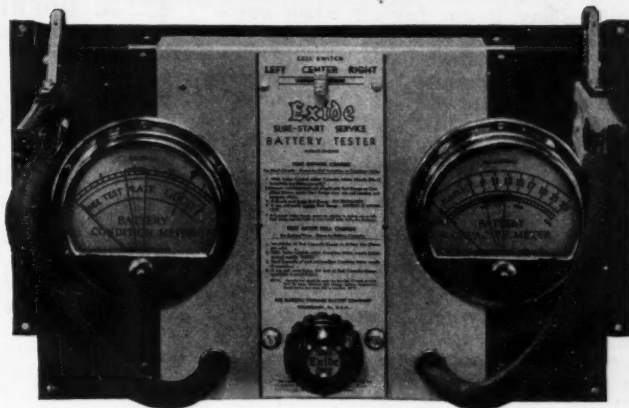
	Gallons Used	Miles per Gal.
Louis Meyer, Ring Free.....	34.59	14.455
Ted Horn, Hartz.....	35.63	14.03
George (Doc) Mackenzie, Gilmore Speedway.....	37.00	13.51
Mauri Rose, F. W. D.....	36.63	13.65
Chester Miller, Boyle Products.....	37.50	13.33
Ray Pixley, Fink Auto.....	36.00	13.89
Wilbur Shaw, Gilmore.....	33.47	14.94
George Barringer, Kennedy Tank.....	34.375	14.55
Zeke Meyer, Boyle Products.....	35.50	14.08
George Connor, Marks-Miller.....	37.16	13.46



## A physician does not GUESS your blood-pressure



**Like the scientific instruments  
used in modern medicine, the Exide  
Sure-Start Tester reveals the facts**



**C**IRCUMSTANTIAL evidence may sometimes enable a dealer to guess right about a battery's condition. But can you afford to operate your business on mere guesswork?

A run-down condition of a battery is no proof that it is worn out. Good batteries as well as worn-out batteries run down. To prevent lost sales and hold your customers' good will, don't try to sell on circumstantial evidence — sell on *facts*!

The Exide Sure-Start Tester tells the facts. If a new battery is needed, you can *prove* it with this scientific instrument. That is only one of the advantages enjoyed by the Exide Sure-Start Dealer. Exide Sure-Start Service enables you to sell not only

new Exide Batteries, but proper grade of oil, spark plugs, cables, etc.—merchandise to correct those conditions on a car that cause the battery to run down.

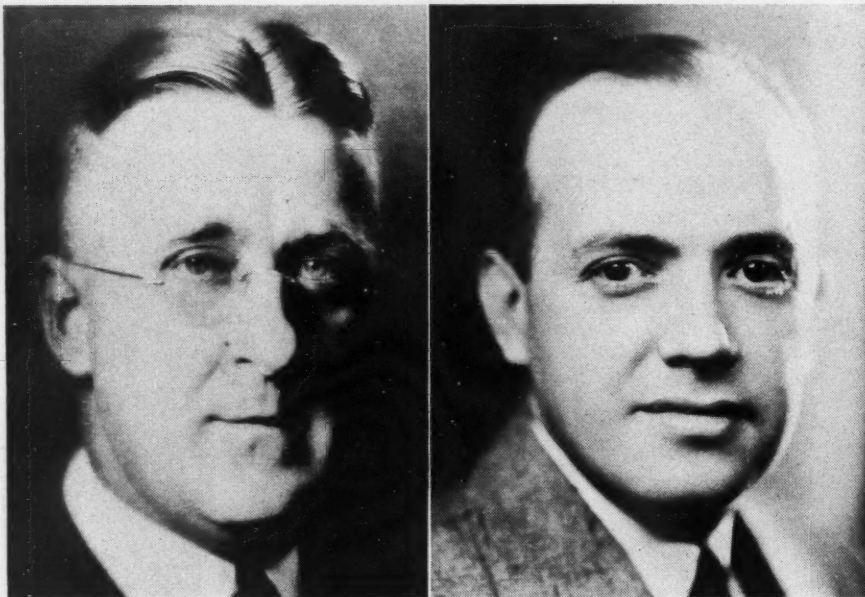
**EXIDE HYCAP BATTERIES** — *Extra high capacity* for the heavier electrical loads on today's cars.

Why not get in touch with your Exide Wholesaler today?

THE ELECTRIC STORAGE BATTERY CO., Philadelphia  
*The World's Largest Manufacturers of  
Storage Batteries for Every Purpose*  
Exide Batteries of Canada, Limited, Toronto



## Modern Equipment Needed for Expert Trouble Shooting, Oberheu Says



The day is not far off when automobile "trouble shooting" will become a matter of pure science, F. A. Oberheu, general manager, United Motors Service, told a gathering of authorized United Motors distributors and service station owners at a meeting held at the Bellevue-Stratford Hotel, Phila., June 12. This was one of a series of meetings which Mr. Oberheu is conducting in 21 of the principal cities of the country on the 20th anniversary of the founding of the organization he represents.

"Present-day motor cars, with high-compression engines, sustained high speeds, automatic chokes, current and voltage regulators and other controls, cannot be properly tested and serviced with obsolete or inadequate equipment," he stated. "The motor car is too complex to take the diagnosis or guess of a mechanic, no matter how good he may be.

"Mechanics need modern, scientific instruments to make accurate tests in order to know exactly what they should do in order to insure satisfaction to the car owner. Then mechanics should have the right kind of tools and machinery to service the job properly. Equipment is manufactured today for testing every part of the car, and likewise equipment for servicing every part of the car in the most economical manner. The ultimate result of the use of such equipment will be more economical motor car service and greater confidence on the part of the public."

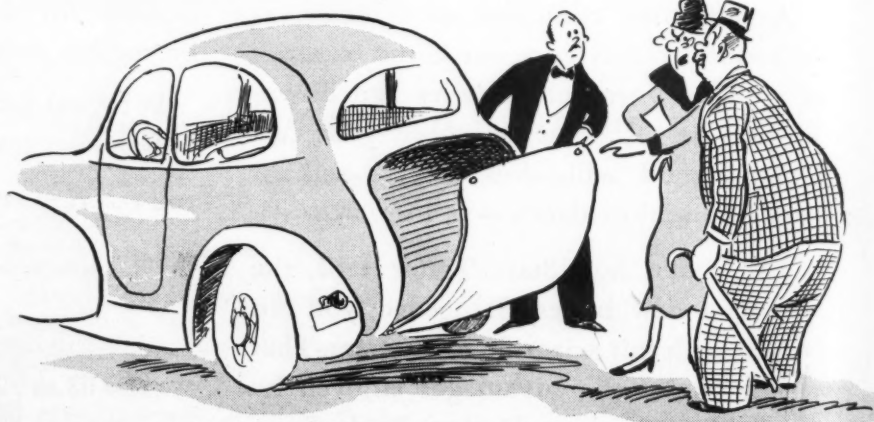
Mr. Oberheu urged dealers to get behind the safety movement in their communities and to make greater use of the information about parts and service methods. W. H. Eichelberger, general sales manager, is assisting Mr. Oberheu in the meetings in the various cities. The meeting was presided over by Mr. D. D. Gildersleeve, regional manager, and Mr. F. E. Hendler, Philadelphia branch manager of United Motors Service.

**F. A. OBERHEU** (left), president and general manager, and **W. H. EICHELBERGER** (above), general sales manager of United Motors Service, who are conducting sales meetings in 21 principal cities.

### A.A.A. Sanctions Midgets

Midget automobile racing has been sanctioned by the Contest Board of the American Automobile Association. The first promotional spot okehed by the governing organization of auto racing and speed competition is the Chicago Armory where Norman Alley has successfully staged events for the tiny cars. The races are staged regularly each week.

It is the Contest Board's plan to accept other midget promoters as they meet requirements similar to those governing the big cars. Drivers and cars will be licensed and all membership of the fraternity will be required to fall in line with the rules governing those driving the big cars, the Contest Board says.

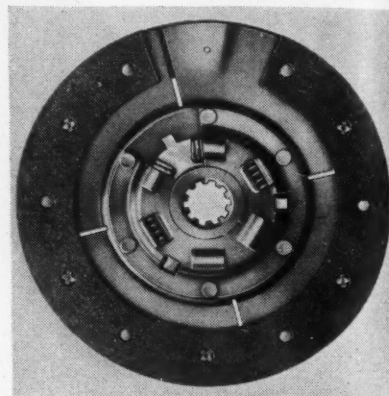


"I don't like that thing—It reminds me of Junior's underwear"

### Spring-center Clutch Plate

A new type of spring-center clutch plate for replacement in Chevrolet, Ford and Plymouth has been announced by Utility Auto Products, Geneva, Ill. The six helical springs which provide the flexible center are completely encased in shields to retain them in place in case of breakage.

It is claimed that extra heavy lugs are formed in the plate so that it will still operate, even though the springs



should break. The disk is of the cushion type to provide smooth engagement without grabbing.

### Milburn Offers New Welding Outfit

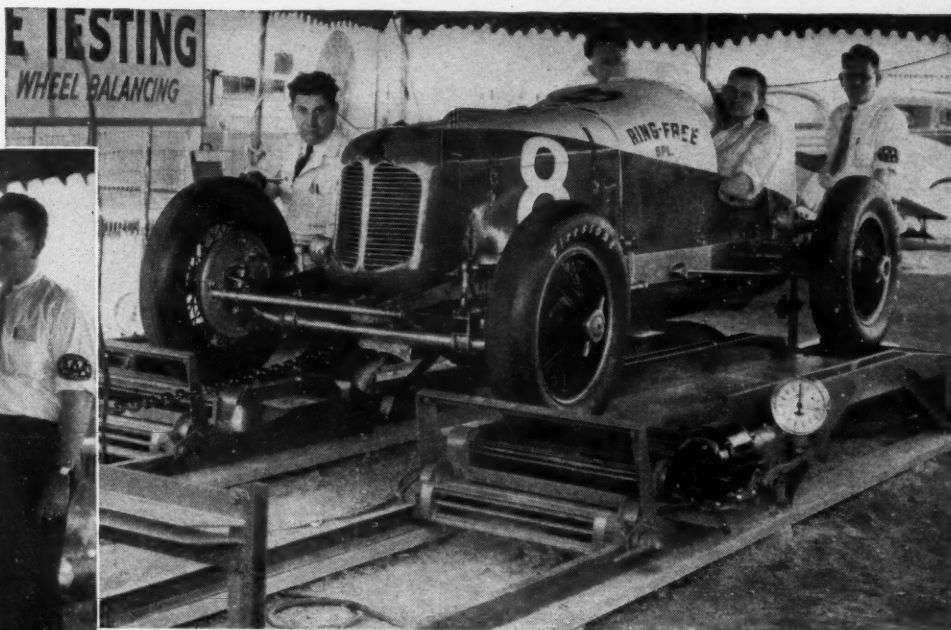
The Alexander Milburn Co., Baltimore, Md., has announced a new Garage Welding Outfit priced at \$59. It is said to be composed of full size, heavy duty equipment such as welding torch with 5 tips, hose with connections, regulators, wrenches, lighter and goggles, and an instruction manual. It is claimed that this outfit will take care of any work in the average repair shop.

### Coronation Red

In 1937, the year the coronation ceremonies will be held for His Majesty King Edward VIII of Great Britain, Province of Ontario motor cars will celebrate the event by wearing coronation red license plates, the Department of Highways has revealed.



Below: Balancing wheels at Indianapolis Speedway pits, on Bendix Dynamic and Static Wheel-balancing Stand



Lou Meyer's car, 1st place winner in the Memorial Day Classic, on Bendix-Cowdrey Brake Tester

# FIRST 4 CARS SMASH RECORDS WITH *Brakes and Wheels* DYNAMICALLY BALANCED BY **BENDIX**



PUTTING brakes into perfect adjustment—tuning them "fine", down to the very ounce of road-resistance—means utmost safety. Dynamically balancing wheels with utmost accuracy means speed with minimum vibration.

All that is pretty elementary to a seasoned service man—but there are still a lot of shops that aren't cashing in on the big public desire for this kind of car conditioning.

Bendix makes the world's most highly developed equipment for

the purpose—priced reasonably—sold on easiest terms—guaranteed right in every respect. Car factories use it for final tests.

Here you see Bendix equipment used in tuning up the Indianapolis Speedway race cars. In case you didn't notice the results *this* year—all four leading cars broke all track records, and did it on less gas and oil than ever before in history.

Write today for catalog and price-and-term arrangements on Bendix Safety Shop Equipment.

**BENDIX PRODUCTS CORPORATION**

(Subsidiary of Bendix Aviation Corporation)

Dept. 11, 401 Bendix Drive, South Bend, Indiana

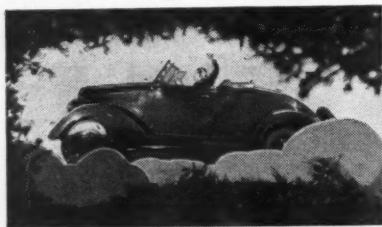


**R**ADIO receiver on the rear carrier of this Indian motorcycle, is one of three hundred machines of the Illinois State Highway Police being equipped with radio receiving sets. A loud speaker is on the handlebars, facing the driver just behind the headlight.

### Ford "Car In The Clouds" At Great Lakes Exposition

Ford Motor Company will have an extensive exhibit in the Great Lakes Exposition at Cleveland, opening June 27 and closing Oct. 4, it was announced at the company's home offices in Dearborn, Mich.

The Ford exhibit will be located in the Automotive Building front section, right at the main entrance. Its



principal novelty feature will be "the car in the clouds," in which, through an optical illusion, a Ford V-8 driven by a pretty girl is seen driving through the clouds above a model town. The car is a real Ford V-8 and it is a living girl driving it, but by means of the optical illusion they are reduced in size so that car and driver are only in miniature.

The Henry Ford Trade School, in which thousands of boys are being given vocational education at the Ford Rouge plant, will be well represented at Cleveland. Trade school students will carry on machine operations and lecturers will explain how the boys are trained.

A miniature model of the wood distillation plant at Iron Mountain, Mich., where Ford manufactures charcoal briquets from hardwood scrap will be in the exhibit. Other Ford by-products will be displayed as well, including ammonium sulphate fertilizer. An exhibit of Johansson gages, made in America by the Ford

Motor Company and used as a standard of measurement by industry everywhere, will be included.

A revolving Ford V-8 chassis showing the mechanical operation of the car will be explained by lecturers. A representative display of Ford V-8, Lincoln V-12 and V-12 Lincoln-Zephyr motor cars, and Ford V-8 trucks and commercial cars will complete the showing.

### Robert Jardine Dies

Robert Jardine, chief engineer of the Wilcox-Rich Corp., and for many years a prominent figure in the automotive world, died suddenly last month on board a steamer arriving

in Cleveland. Death was attributed to heart failure.

Mr. Jardine was 58 years old. He entered the automotive industry in 1899 as chief engineer for a French automobile manufacturer, and returned to this country in 1903. He was responsible for many developments, particularly in the valve field. In point of service, he was one of the oldest men in the industry in this country.

Mr. Jardine was a member of the Society of Automotive Engineers, the Detroit Athletic Club and the Detroit Yacht Club. His widow and a son, Robert, survive.

### New Low-Priced Car Washer Announced by Continental

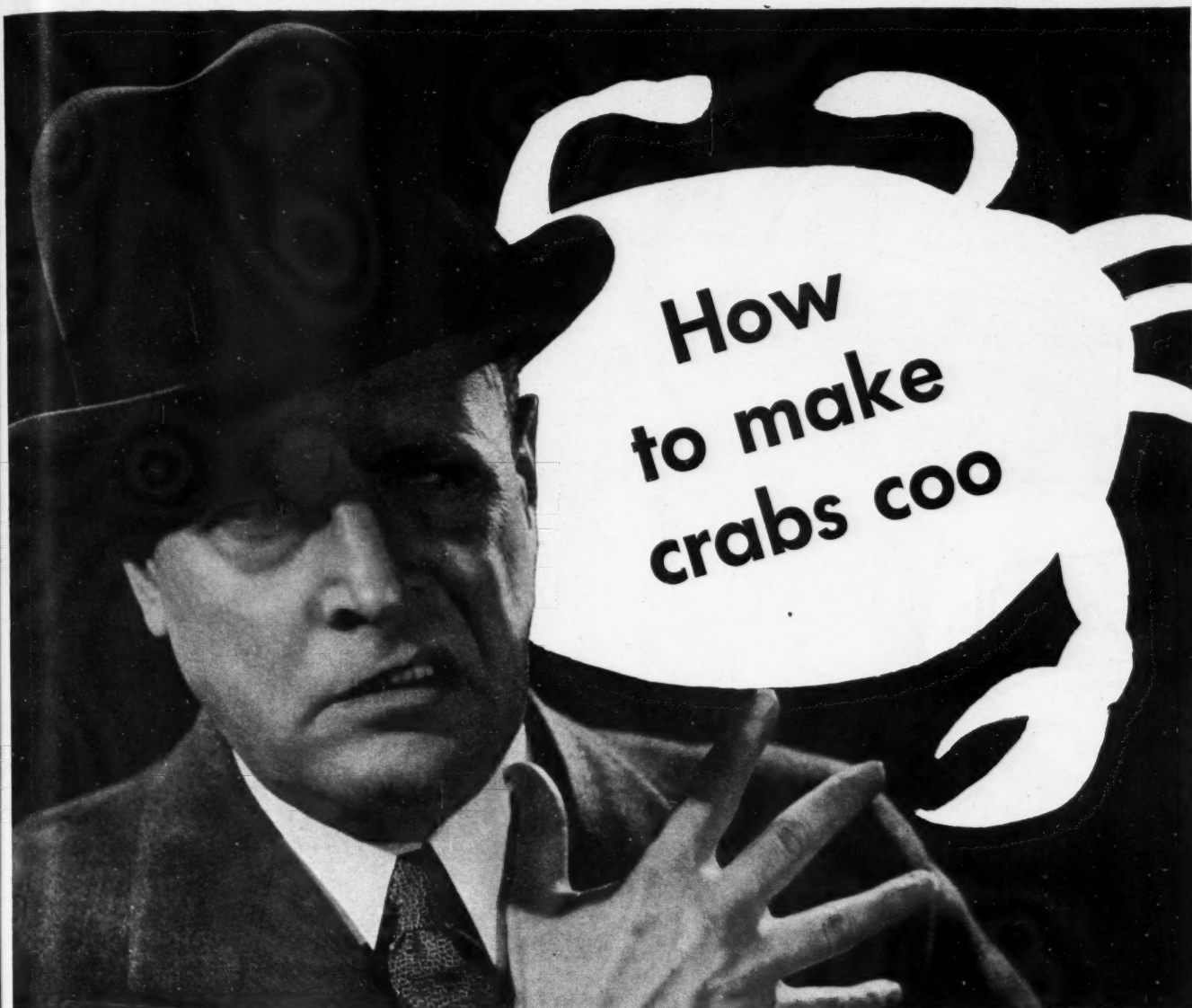
For the benefit of smaller service stations, the Continental Rubber Works, Erie, Pa., has announced a new Vitalic Hilo All-purpose Washer to sell for \$19.80 complete.

The Vitalic washer is said to eliminate the need for special power equipment by utilizing the regular service station air line. A fully equipped nozzle with air valve to regulate the water pressure, and an adjustable tip to regulate the spray is included with 25 feet of water hose and 25 feet of air hose, with all necessary couplings.



**M**R. AND MRS. HIRAM H. DOHNER of Quentin, Lebanon County, Pa., in their 1913 Royal Mail Chevrolet roadster. The Dohner car was found to be the oldest Chevrolet licensed and in daily use in the U. S. The Dohners received a new 1936 Chevrolet last month.





**YOU'VE** met him. A chronic crab. Give him the slightest grounds for a squawk about his new car and he'll let out a moan they can hear in Frisco.

Fortunately there are few of his kind, but even one kicker can kill a dozen or so potential sales.

So it's good business to do everything in your power to see that every potential kicker becomes an enthusiastic booster. Which means, among others, doing two things.

First . . . fill the crankcase of every car you deliver with the world's finest motor oil, *Gulfpride*. This 100% Pure Pennsylvania oil will do more to keep a good motor in good shape than any other oil made. It forms far less sludge and gum—and has actually lubricated automobile motors for 80,000 miles without any need of removing carbon!

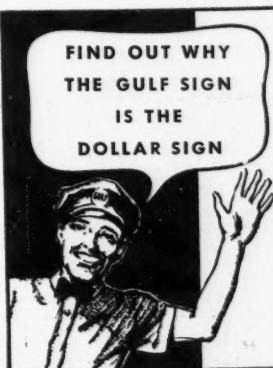
Second . . . load the tank with *Gulf No-Nox Ethyl, Aviation Grade Gasoline*.

It adds zip to a fast car, gives it even more pick-up, power and pep . . . and helps you transform a natural doubting Thomas into an extreme enthusiast.

Fill out the coupon below and get the complete Gulf story . . . also a FREE copy of a brand-new book, "You Can't Call It Luck!" It tells why doing business with Gulf is most profitable to you. Mail the coupon today!



Each Sunday evening, Gulf's radio program salutes a different motor car and its dealers. Columbia Network, 7:30 E. D. S. T.



GULF, 3800 Gulf Building  
Pittsburgh, Pa.

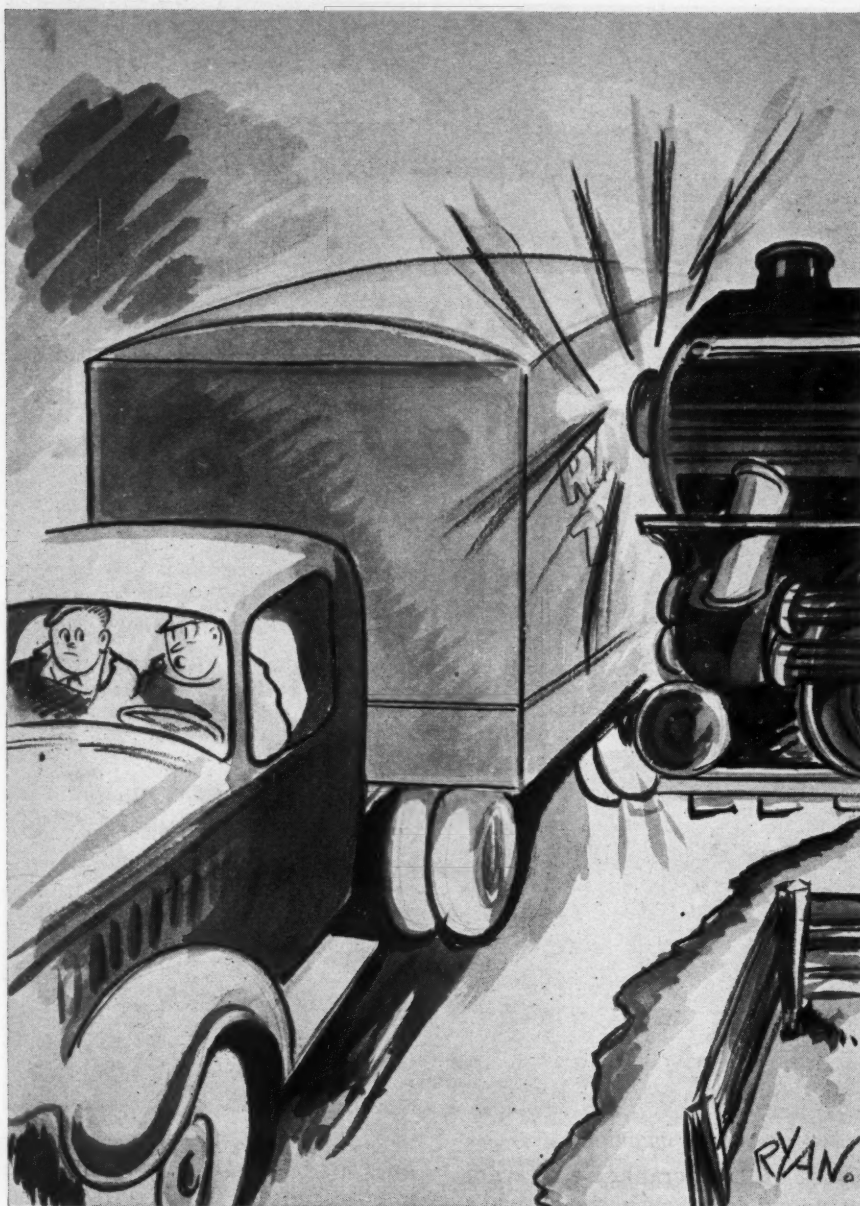
MA-76

Please send me a FREE copy of your new book for dealers, "You Can't Call It Luck!"

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



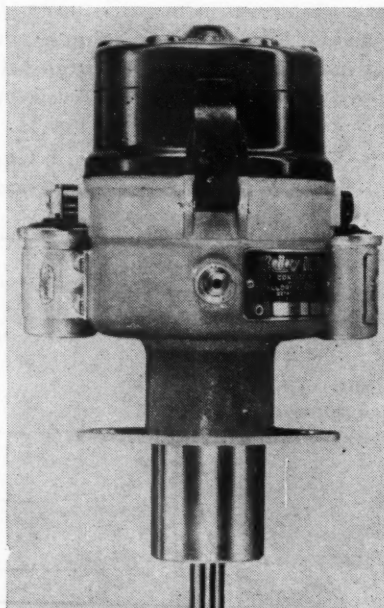
*"We better stop at the next garage. That rear end sounds kinda noisy!"*

### **Mallory Ignition System**

#### **For Oil-Burning Engines**

A special ignition system for heavy-duty oil-burning engines and for engines using low-grade fuels has been placed on the market by the Mallory Electric Corporation, Detroit, Mich.

The Mallory Electric Ignition System is said to be based on an entirely new and different principle from any other battery ignition system. The coil is a completely closed magnetic circuit transformer. It employs a distributor having two sets of breaker points, synchronized to operate one set 15 degrees after the other set, each having a dwell of 35 degrees, so that an overlap of 20 degrees is provided during which both sets of points are closed. There are two primary windings in the coil, so wound as to set up opposing magnetic flux. When both circuit breakers are closed, the lines of magnetic force in the two cores oppose each other, so that when the first set of points opens a very

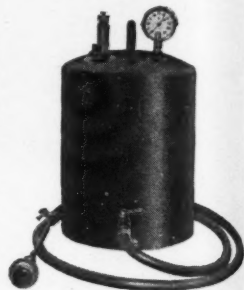


rapid change of flux takes place in the secondary winding, resulting in a very hot spark.

An interesting variation in the system is the design of a horizontal distributor mounting for replacing magneto installations. Wipe spark contacts are used and the entire head mechanism is provided with seals against the entrance of air, dust and moisture. Due to the air-tight construction, the head chamber is vented by means of a suction line connected to the air cleaner inlet.

### **Curtiss & Smith Makes Hydraulic Brake Tool**

A Bleeder tank and Master Cylinder filler for hydraulic brake work has been announced by Curtiss & Smith Mfg. Corp., Pottstown, Pa. It is said to be of 2-gallon capacity, and equipped with safety valve, pressure gage, standard air gage, filler plug, long hose and easily attached master cylinder connections to fit all cars. Price Complete \$15.00. Truck attachments \$2.00 extra.



### **Offers Packaged Parts For Motor Rebuilding**

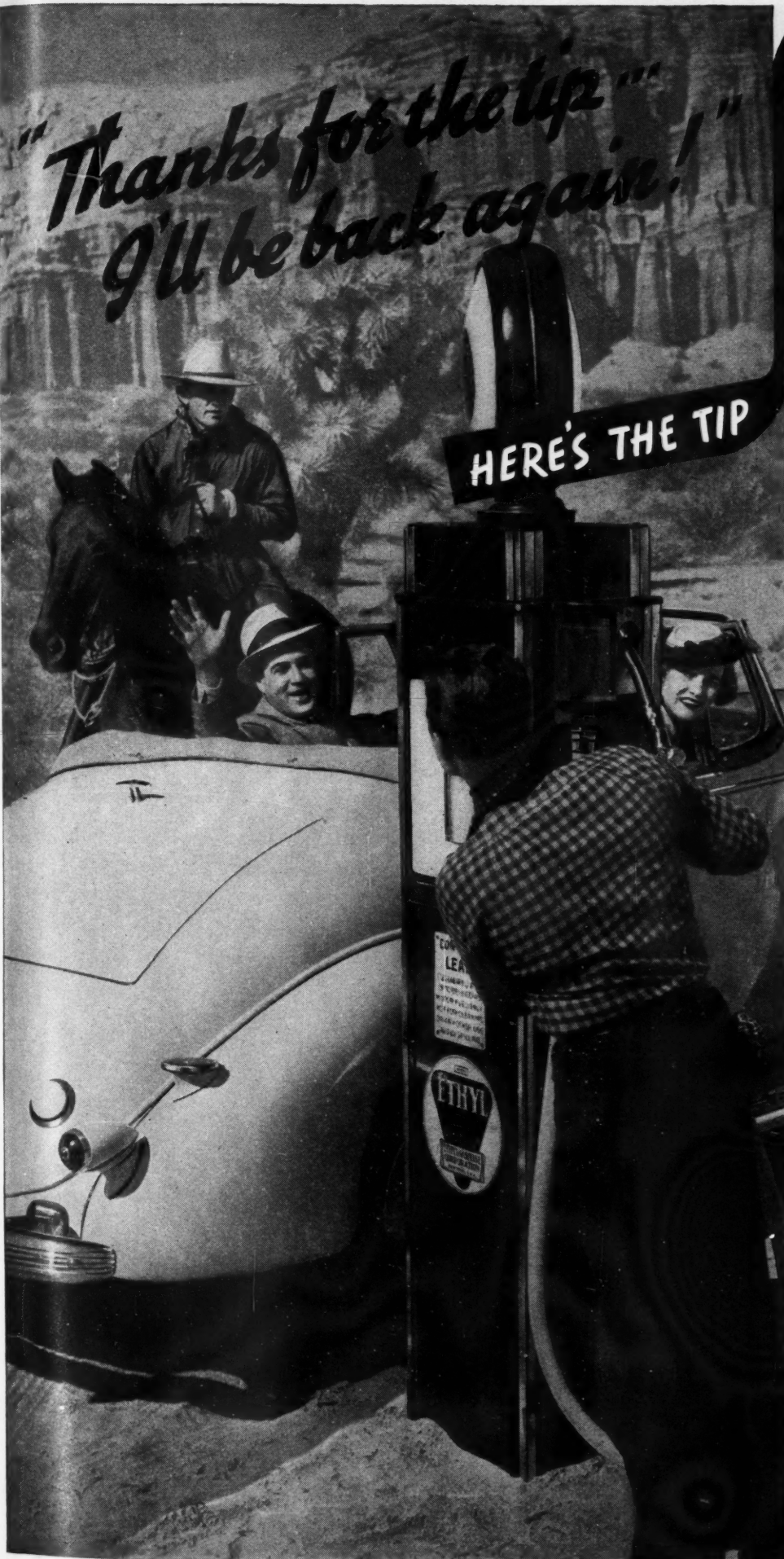
Spencer-Smith Machine Co., Howell, Mich., has announced a parts package which is said to include pistons, rings, valves and all parts necessary to completely rebuild a Ford V-8 motor. The package is to sell for \$17.85. The sets are supplied in sizes from .020 in. to .060 in. oversize, and are said to be ready for instant installation in the engine.

### **Plymouth Pistons Cooled To Check Size Accuracy**

A new system for cooling pistons, developed by the Plymouth Division of Chrysler Corp., is the latest contribution to precision measurement of vital engine parts. The new units provide accurate temperature control at the point where the pistons are checked by Electrolimit gages for size, and eliminate the possibility of minute variations in piston size which might be due to temperature differences.

By means of the new system all pistons reach the gages at a temperature of exactly 78 deg. Fahr. Uniform temperature controls have been installed and are now in operation on the four piston conveyors which run to the final inspection tables. Pistons now move without delay on the piston conveyor chains which lead to the electric gages, passing through cooling tunnels, which are horizontal metal cylinders, insulated on the outer surface, and containing thin-walled water jackets. Water flowing around the jackets cools the pistons to the temperature desired for the test.





in 43 seconds

## A HOT TIP ON COOL DRIVING THIS SUMMER

**BEWARE** a "pinging" sound this summer when you "step on the gas" for pick-up, or hills. It is your engine's way of saying: "I feel hot weather, too. I'm losing power, wasting gas and overheating. Give me better gasoline."



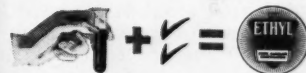
**KNOCK** is the name of that warning "ping." It occurs when a gasoline breaks down (burns too quickly) under the heat of a modern high compression engine.

Cars built in recent years have high compression engines. And in summer the knocking evil is at its worst because hot weather increases engine heat.



**THE CURE**—and preventive—of knock is better gasoline. That is why most oil companies now improve gasoline by adding anti-knock fluids (containing tetraethyl lead) made by the Ethyl Gasoline Corporation.

They recommend, as their best fuel for summer driving, special gasoline sold at pumps marked "Ethyl" on the base or globe.



**YOU GET** at the "Ethyl" pump:

- ✓ Enough anti-knock fluid to stand up under the highest engine compression on the hottest day.
- ✓ All-round quality that is double-checked—by the oil companies and the Ethyl Gasoline Corporation—at the refinery and at the pump.

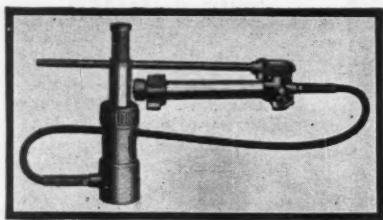


Give your car the coolest fuel this summer. Avoid knock, with its power loss, gasoline waste and overheating. Get more power from each gallon of gasoline you buy!

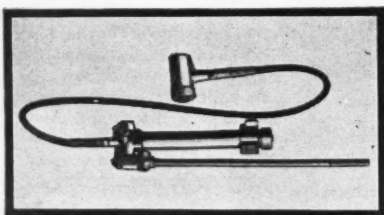
**NEXT TIME GET ETHYL**

## Blackhawk Additions to Porto-Power Line

Blackhawk Mfg. Co., Milwaukee, Wis., has announced two additions to its Porto-Power line, one being a seven ton short ram for close work on



bodies, frames and fenders, and the other a 20-ton ram unit for heavy duty work on frames, axles, chassis and general shop work. The short ram, Model S-66, has an overall length, collapsed, of 4½ in., and the



plunger travels 2½ in. The 20-ton Porto-Power Unit has a collapsed height of 10¼ in., with a lift of 4½ in.

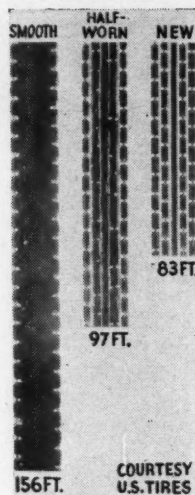
## Capital Increase Voted by Automotive Equipment, Inc.

At a stockholders' meeting of Automotive Equipment, Inc., New York, an increase in the amount of authorized capital was approved and the following directors elected: Howard E. Coffin, chairman, formerly vice-president of Hudson and present chairman of National Air Transport; C. Townsend Ludington, organizer and formerly president of Ludington Air Lines, director of National Air Transport and manufacturer of autogyro planes; William F. Jetter, formerly treasurer of the Superheater Co. and general manager of the Pneumatic Scale Co. of Boston; C. S. Sale, member of the firm of Sale, Ashman and Benedict, Inc., New York, industrial engineers and formerly president of the American Car and Foundry Motors Co., and O. H. Simonds, formerly public utility executive with Electric Bond and Share and Appalachian Gas Corp.

The new officers of Automotive Equipment are: C. S. Sale, president; L. J. Buckland, vice-president; O. H. Simonds, treasurer, and C. Franklin Hennecke, secretary. The company manufactures in its plant at Long Island City windshield cleaners and other automotive devices, and the new organization plans an increase in plant facilities.

**FRED ASTAIRE**, musical comedy headliner of stage and screen, will be heard in a weekly series under the sponsorship of the Packard Motor Co., starting this autumn.

Showing the distances required by tires with various degrees of wear to stop a 3500 lb. car at 40 miles an hour on wet pavement. A chart created by U. S. Tires



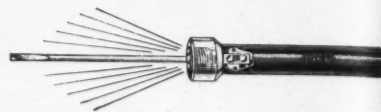
## What Causes Blow Outs

Short's Tire Service, of Louisville, Ky., used a window display to show an interesting collection of articles picked up by tires on the city streets. This is the collection of "Bill" Schooler, in charge of the service court at Short's, and shows practically everything from a corkscrew to a horseshoe that have been taken from the tires of Louisville motorists during the past 26 years.

National Automotive Parts Association has published a 48-page Mechanics' Repair Manual for Chevrolet cars, covering all models from 1931 to 1936, inclusive. The manual is available through all NAPA warehouses and jobbers.

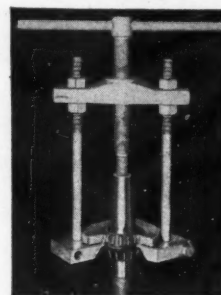
## New Flashlight Screw Driver

A new development of the Stanley Rule & Level Co. of New Britain, Conn. is a combination screw driver and flashlight in one unit. It has a black and amber "Stanloid" handle, which holds two standard batteries and a flashlight bulb. The blade is 3/16 in. in diameter and cross ground to size and magnetized for picking up small objects. List price \$1.65 with batteries. Slightly higher west of Missouri River.

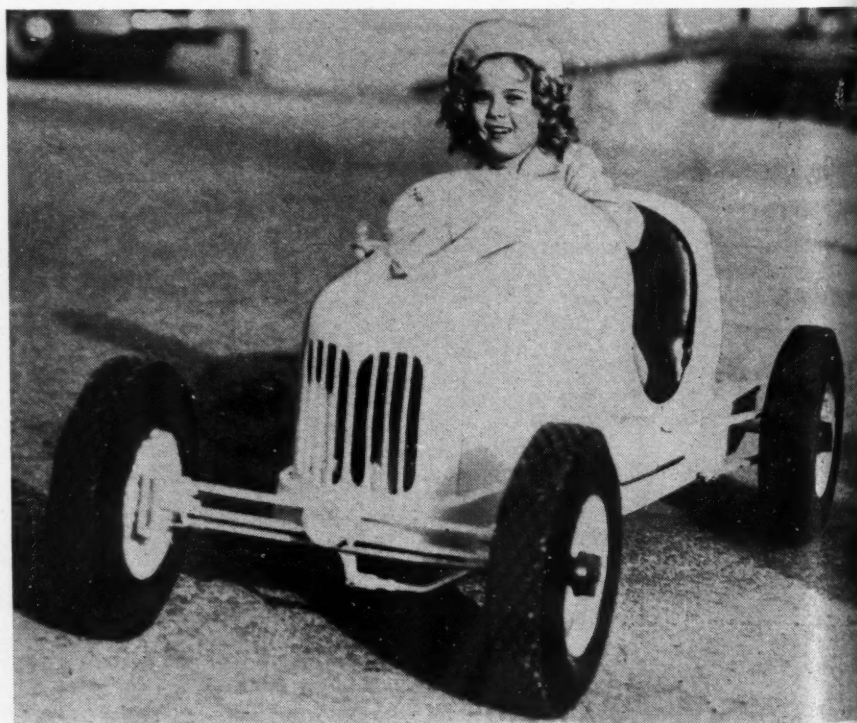


## Curtiss Bearing Puller

Curtiss & Smith Mfg. Corp., Pottstown, Pa., announces a bearing puller for Timken and other bearings. It is said to be especially adaptable for pulling differential side bearings, or



back-to-back bearings without damage to the bearing.



**SHIRLEY TEMPLE**, petite film star and her first automobile, a miniature convertible coupe given her by Bill Robinson, dancer. It's a one-cylinder job which Shirley drives at nine m.p.h.





## BACKGROUND FOR PERFECT LUBRICATION

The above illustration is an electron diffraction pattern identifying a graphoid surface on cast iron. + Modern research has not only proved through electron diffraction methods the presence of the graphoid surface, but has gone further and shown that friction so aligns the graphite particles on metal as to safe-

guard "shock points" against wear-producing metal-to-metal contact. Further, this surface, formed with oils which contain "dag" colloidal graphite, has greater attraction for oil than does bare metal, minimizing oil film rupture. Clearly, this surface provides a background for perfect lubrication. + Write for booklet.

ACHESON COLLOIDS CORPORATION + PORT HURON, MICHIGAN

*Ask your oil supplier about his colloidal-graphited brands today.*



# COLLOIDAL GRAPHITE

© 1936, A.C.C.



**PERFECT ALIGNMENT AT THE RACE TRACK.** Like a giant automotive trailer, this automatic stall gate is operated by the official starter by simply touching a button. It is said to keep the "nags" in perfect starting alignment. The scene is at the Hialeah track, Miami, Fla.

## Repairman's Visit To The

# FACTORIES

The Automotive Maintenance Machinery Co. of North Chicago has completed the purchase of the Hempy-Cooper Mfg. Co. of Kansas City, Mo. With the purchase the Hempy-Cooper Co. has been completely liquidated and their inventory of raw materials, finished products, jigs and fixtures has been moved to the AMMCO factory.

\* \* \*

A. D. Gardner has joined the engineering development division of Wilcox-Rich. Mr. Gardner was formerly chief engineer of the Automotive Fan and Bearing Co.

\* \* \*

As a safety measure, a specially designed placard, scientifically tested for visibility, is placed on the back of each test car, by test engineers of the United States Asbestos Division, Manheim, Pa., makers of Grey-Rock Balanced Braksets. The sign proves to be a very effective warning to motorists following the test cars, since the cars must come to so many quick stops.

\* \* \*

At the annual meeting of the board of directors of the American Chain Company, Inc., Bridgeport, Conn., May 19, the following officers were elected: Walter B. Lashar, chairman of the board, William T. Morris, president, Wilmot F. Wheeler, executive vice-president and treasurer, Arthur P. Van Schaick, vice-president in charge of sales, Charles G. Williams, vice-president in charge of production, and William M. Wheeler, secretary.

C. B. Cook, who for several years was sales manager of Edison-Splitdorf Corp., has been named sales manager for J. A. Tumbler Laboratories, Baltimore, Md.

\* \* \*

McAleer's new merchandising campaign is based on the slogan, "Keep Cool This Summer, Keep Warm This Winter." The deal offers each purchaser of a \$9.90 factory-packed assortment of McAleer polish, paste cleaner, wax, top dressing and touch-up enamel his choice of a Polar Cub Electric Fan or Gilbert Electric Room Heater.

\* \* \*

The recently organized Safety Cushion Bumper & Mfg. Co., Detroit, has started production of its new type Safety Cushion bumpers which are ready for the market in four models, designed for passenger cars, trucks, buses and trailers.

\* \* \*

Chas L. Zabriskie, general sales manager of Rogers Products Co., Inc., of Jersey City, N. J., has named new representatives in Fort Worth, New Orleans and Akron.

\* \* \*

Tunis J. McNaughton, has been appointed to represent the Keystone Reamer & Tool Co., Millersburg, Pa., in Ohio, Indiana and Kentucky.

\* \* \*

E. R. L. Boyd was recently appointed sales manager of the Ray Day Piston Co., Detroit.

\* \* \*

Consummation of a selling arrangement whereby the Armstrong Cork

Products Co. will act as sales agents in the equipment insulation field for the Corning Glass Works' new highly refined wool insulation consisting of long, interlocked glass fibres, is announced by L. E. Cover, manager of Armstrong's Equipment Insulation sales department.

\* \* \*

Micromatic Hone Corp. has announced completion of a new addition to its Detroit plant. Herbert J. Woodall has recently been elected to the board of directors of that company.

\* \* \*

Appointment of Ralph K. Super, as chief engineer has been announced by B. A. Linderman, president of Linderman Devices, Inc. Mr. Super for the past six and a half years has been in charge of the development and application of brake equipment to trucks, buses and fire apparatus at Mack International Motor Co. Also announced is the appointment, as chief draftsman for Linderman Devices, of H. D. Roling, recently sales engineer for the Buffalo Fire Appliance Corp.



\* \* \*

The appointment of R. G. Warner as sales manager of its replacement division, is announced by the Asbestos Manufacturing Co. of Huntington, Ind.

\* \* \*

P. R. Mallory & Co. of Indianapolis has opened a new factory branch in Detroit. John D. Tebben, Detroit manager, is in charge.

\* \* \*

The Bantam Ball Bearing Co. is adding new machinery and building an addition to its plant at South Bend at a cost of \$250,000.

\* \* \*

L. A. Dall, vice-president of Aluminum Industries, Inc., makers of Permite Products, Cincinnati, announces the appointment of W. E. Arnold, as district sales representative with headquarters in Detroit.

\* \* \*

Federal-Mogul Corp., Detroit, Mich., has opened a new branch warehouse at 1314 Jones Street, Omaha, Neb.

\* \* \*

## Supplements Service Data

The U. S. Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa., is mailing 8-page Supplemental Service Bulletins to fleet owners, garages and fleet maintenance supervisors who have registered their copies of the Grey-Rock Commercial Transportation Recommendation Guide with them.

This is the first of a series of such Service Bulletins, which are to be released periodically during the year, the Grey-Rock Merchandising Department states.



## Up-to-date Flat Rate Information

### Buick Series 40, 1936

Opr. No.	Mfr. hrs.	Opr. No.	Mfr. hrs.	Opr. No.	Mfr. hrs.	Opr. No.	Mfr. hrs.
A7x	2.3	C12	1.6	L7	.5	S10	.4
A9x	.8	C13	.8	L11	.3	U1	.2
A11	2.1	D4	.3	M1	2.5	U3	.4
A13	.7	D5	.6	M4	3.4	U3x	.3
A14	5.0	D7	1.3	O1	N.C.	U4	.5
A20	1.2	D7x	1.5	O3	4.9	U6x	.3
A21	1.6	D8x	.1	O4	4.2	U9	1.9
B3	.6	D10	.5	O7	N.C.	U12	.3
B4	1.2	D11x	.6	O8	7.1	U13	.6
B8	2.0	D12	1.3	O14	10.2	U15y	1.3
B13	4.2	D13	.6	P1	4.8	U17x	.8
B13a	.8	F6	1.9	P3	7.3	U19	.3
B16	.6	F13	1.2	Q3	3.8	U20	.5
B17x	.9	F14	2.4	R1	2.7	U21	1.7
B22	.8	F15	2.2	R2	7.3	U22	.3
C1	3.2	F19	1.3	R4	1.5	V1	2.2
C2	1.5	H5x	3.1	R5	5.9	V3	1.2
C5	.2	H5a	.8	R9	5.0	V5	1.3
C6	.2	L1	5.5	S1	.2	X1	.7
C10	.4	L6	.5	S8	1.4	X9	1.2

Ⓜ M4 includes installation of new sprockets.  
N.C. No charge.

### Geo. R. Murphy, Jr., Dies



George R. Murphy, manager of the Pacific Coast District of The Electric Storage Battery Co., Phila., died May 14.

Mr. Murphy was 61 years old and had been in the employ of the company for 36 years. He was widely known and

esteemed on the Pacific Coast, particularly in engineering circles and in the automotive trade.

In 1900 he joined The Electric Storage Battery Company, and was employed in the operating department at both Philadelphia and New York. Three years later he was transferred to the San Francisco branch, being connected first with the operating and then with the sales departments. In 1916 he was placed in charge of the San Francisco branch and shortly thereafter was made manager.

Mr. Murphy was president of the San Francisco branch of the Columbia University Alumni Assn.; a member of the Engineers' Club of San Francisco, the Merced Golf and Country Club, the Society of American Military Engineers, and a Fellow of the American Institute of Electrical Engineers.



**NIGHT - TIME** headlight inspection on the highways is part of the campaign under the direction of Chief William Cole of the Washington State Patrol. A Weaver Photoelectric Headlight Tester is used for headlight inspection.



## ... Speaking of Sales Helps

A chart that is said to contain the very latest brake information, including instructions on how to do the job, is being distributed by Grey-Rock jobbers, according to a report from the United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa.

\* \* \*

The Wagner Electric Corp., St. Louis, Mo., is offering window displays and advertising folders illustrating Lockheed Brake Fluid and their line of hydraulic brake tools and parts. They are also in a position to supply cuts for jobber use in illustrating catalogs, advertisements, etc.

\* \* \*

The Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Ct., reports increased sales of PG Brake Lining Sets through the use of an attractive cabinet which is both a display and storage cabinet offered to dealers in connection with the new Raybestos Senior Deal in PG (Proving Ground) brake lining.

### New Catalogs

Linderman Devices, Inc., New York City, has just issued a 16-page manual covering the operation, construction, installation and servicing of Linderman brakes. The manual goes into considerable detail covering the design and advantages claimed for these brakes.

\* \* \*

Two new booklets, "How To Cut Screw Threads" and "How To Grind Lathe Tool Cutter Bits," have just been published by The South Bend Lathe Works, South Bend, Ind. A charge of ten cents per copy is made to cover cost of handling and postage. Address your request to The South Bend Lathe Works.

\* \* \*

A new catalog, the "DE," has been issued by the DeVilbiss Company of Toledo, Ohio, to replace the "DD" catalog. Illustrations, description and prices are given of their spray-painting equipment, exhaust fans and booths, air hose and other items of service station equipment.

\* \* \*

A new manual on the subject of wheel alignment has been issued by the Weaver Manufacturing Co., Springfield, Ill. Containing 118 pages the manual is said to contain a large number of illustrations, with particular attention being given to the various types of tire wear resulting from underinflation and misalignment.

\* \* \*

A 56-page book known as Catalog No. 136 has just been issued by The Bonney Forge and Tool Works, Allentown, Pa., describing and illustrating their complete line of sockets, wrenches and tools. Numerous complete sets ranging in size from 3 to 138 pieces, in a wide range of prices, are shown.

\* \* \*

The Kawneer Co., Niles, Mich., has issued a new book showing views of Kawneer Rustless Metal Store Fronts, taken from installations made in this and foreign countries. The book is intended to serve as a source of ideas for architects, builders and merchants of every type.

\* \* \*

The Delta Mfg. Co., Milwaukee, Wis., has issued a new catalog describing their complete line of motor and belt driven grinders, furnished in bench and pedestal models. The catalog also illustrates and describes the Delta line of drill presses, band saws, lathes, grinding wheels and a line of one-third, one-half and three-quarter horse power electric motors.

# BIGGEST BATTERY

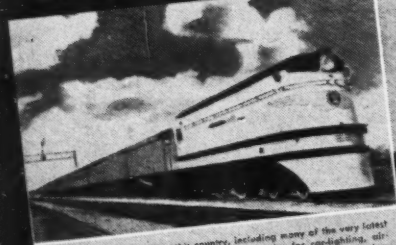
WATCH FOR THIS DOUBLE-PAGE  
ANNOUNCEMENT IN THE  
**SATURDAY EVENING POST**  
September 19

At last... A BATTERY UNCONDITIONALLY GUARANTEED  
AS LONG AS YOU OWN YOUR CAR



THIS AMAZING GUARANTEE, which comes with every Kathanode Battery, is your protection against battery replacement expense AS LONG AS YOU OWN YOUR CAR. There are absolutely no other conditions. Each Kathanode Battery is individually registered by number and guaranteed in the name of the car owner.

WHERE BATTERIES GUARD AGAINST DISASTER... ENGINEERS CHOOSE KATHANODE!



43 MAJOR RAILROADS in this country, including many of the very latest streamlined trains, use Kathanode type batteries for signaling, air conditioning, switching locomotives and dependable signal operation.



OTHER GREAT NAVIES—British, German, Italian, Swedish, and Dutch—are extensive users of Kathanode type batteries for every kind of vessel—from submarines to dreadnaughts.



U. S. NAVY AIRPLANES, battleships and coast guard vessels, depend on long-lived Kathanode type batteries. For many years the United States Government has been a regular purchaser of these famous batteries.



UNCONDITIONALLY GUARANTEED

THE SECRET OF KATHANODE'S LONG LIFE  
The heart of your battery is the active material—those power-producing lead particles contained in the plates. In an ordinary battery, constant vibration and natural wear cause this active material to drop away from the positive plate and the battery becomes weaker and weaker. In the Kathanode Battery, the active material is held in place by a special flexible, porous spun glass "retainer mat" not only protecting the active material, holding even the tiniest particles in place, but also acting as an additional insulation against short circuiting. This patented construction is the secret of the Kathanode Battery's long life.

WRITTEN GUARANTEE... made possible by the long use on airplanes, submarines...

DRIVE your car like—three, five, ten years—spend a penny to register your new Kathanode. Where batteries matter, the long life of the Kathanode has been tested for years... in today's important uses... Navy airplanes... British dreadnaughts... crack trains... and Broadway industries... Now for the Kathanode type adapted for your only phenomenon new kind of performance. Battery experts.

THESE GREAT COMPANIES ARE AUTHORIZED

GOULD STORAGE BATTERY CORPORATION • GENERAL TIRE & RUBBER CO. • NATIONAL BATTERY COMPANY



# NEWS Ever Announced

## UNCONDITIONALLY GUARANTEED DOWN YOUR CAR

against all battery replacement expense  
the long Kathanode Cell, famous for its world-wide  
marines... now adapted for your automobile!

### THE SECRET OF KATHANODE'S LONG LIFE

The heart of your battery is the active material—those power-producing lead particles contained in the plates. In an ordinary battery, constant vibration and natural wear cause this active material to drop away from the positive plate, and the battery becomes weaker and weaker. In the Kathanode Battery, flexible, porous spun glass "retainer mats" not only protect the active material, holding even the tiniest particles in place, but also act as additional insulation against short circuiting. This patented construction is the secret of the Kathanode Battery's long life.

## WE ARE AUTHORIZED TO OFFER YOU KATHANODE BATTERY

GOULD STORAGE BATTERY  
CORPORATION

GENERAL TIRE & RUBBER  
COMPANY

NATIONAL BATTERY COMPANY

THE PURE OIL COMPANY

RICHFIELD OIL COMPANY  
OF CALIFORNIA

CONSOLIDATED,  
INCORPORATED

**MORE TO COME!**  
FULL PAGE FOLLOW-UPS  
TO APPEAR THIS FALL IN THE  
SATURDAY EVENING POST

## NEW KATHANODE BATTERY . . . BACKED BY A SENSATIONAL GUARANTEE . . BRINGS YOU THE GREATEST OPPORTUNITY FOR BATTERY PROFITS IN HISTORY!

A BATTERY unconditionally guaranteed as long as a motorist owns his car! A battery based on the famous long-lived Kathanode cell, used for 11 years by the world's great navies, airplane fleets, railroads, power plants!

That's the new Kathanode Battery all the motoring world will be talking about this fall. A smashing 2-page announcement in the Saturday Evening Post starts the ball rolling in September. Full-page follow-ups keep it rolling right through the battery season!

This new battery actually opens a *brand new market for you—through the new car owner*. Never before has a battery given you such a great opportunity to increase sales and profits . . . never have you had such an amazing array of newsy, factual features to help you get your share of this new business.

### LOOK AT THESE HIGHSPOTS:

**Unconditional guarantee,** in writing, good for the life of a motorist's car, as long as he owns it.

**"Lifetime" construction**—the exclusive, patented Kathanode principle used by great industries, navies and railroads for 11 years.

**Phenomenally long life**—Kathanode spun glass insula-

tion retains active material, preventing loss through vibration, abuse, natural wear.

**Hair-trigger starts** in coldest weather—performance exceeds SAE specification at zero temperatures by 105%.

**Plenty of reserve power** to operate radio and all other electrical accessories of the modern car.

"Exactly what does this new Kathanode Battery pay me in profits? How can I take it on?" Get the complete answers to these questions immediately by rushing your request to the Kathanode Corporation, Chicago.

**THE KATHANODE CORPORATION**  
NEW YORK • CHICAGO

## DISTRIBUTE THE NEW KATHANODE BATTERY

THE PURE OIL CO. • RICHFIELD OIL COMPANY OF CALIFORNIA • VESTA CONSOLIDATED, INCORPORATED

## Don Herr Goes Super Service

(Continued from page 19)

real lubrication equipment. Here is a bunch of job tickets. You will notice that my base price for a chassis lubrication is \$1. But the average lubrication job that I write in my shop comes to \$4.85. That's good business for any shop and what's more, in the three weeks I have had this equipment, I have gotten 75 brand new customers and I really haven't gotten under way yet.

"Of course that \$4.85 average is not only lubrication work. A lot of additional jobs went to build up that average. But the important thing is that the customer came in originally for a lubrication job only and the additional jobs which were sold brought up the average.

Naturally this super-service business requires good salesmanship. It isn't enough to just have a customer come in and get his car greased. He has to be sold a complete lubrication job and at the same time his car has to be inspected for other work that may be needed. No, you don't have to use any high-pressure methods. After inspecting the car you point out to the customer those units or parts that require service and in the majority of cases he buys. In addition there are millions of car owners all over this United States who are still shopping around for some place that will actually do a good job and are perfectly willing to pay a good price, provided they get a good job.

"It is also necessary to keep a complete record of all customers and the work that has been done on their cars. With such a record as a basis, it is possible to follow up the customers so that they will return at the end of the lubrication period for another job.

"For the present, I am using a pit which has been in position for several years. However, that is only a temporary condition, as I am going to invest in a lift very soon for the simple reason that they help bring in the business.

"But that's enough of business for today. Let's go out to the Speedway and watch them qualify for the race on Memorial Day. Besides I want you to take a look at the wheel aligner out at the track. I just bought it, and as soon as the race is over I'm having it moved in right next to the lubrication department.

## Shock Absorbers

(Continued from page 21)

### Servicing the Delco-Lovejoy Two-Way Horizontal Type, Series 1600 and 1610

The principle difference between this type and the single acting type is that the two-way shock absorber acts on compression as well as rebound, there being a compression and a rebound relief valve operating on each movement of the arm.

When complaints of bouncing are received it is possible to correct the condition by changing the rebound



"Look, there's another accident!"

"Gosh, it must be awful risky to work down there on the street."

valve to one offering more resistance. The rebound valve is the one opposite the arm. Internal noises may be caused by a loose arm or cam shaft, loose cam set screw, broken piston, broken cam tension spring or loose or badly worn cam bearing buttons. To correct any of these conditions it is necessary to disassemble the unit, which is done by removing the cover screws and plate. Be sure to punch-mark the cam and the cam arm to insure proper setting of the arm when reassembling. Remove the piston cylinder nut, loosen the intake valve assembly and press out the cam shaft, making sure that the cam lines up with the opening on the cover plate side of the unit. Then remove the piston, packing gland and washer, and the compression and rebound relief valves.

Series 1400, 1700 and 1900 shock absorbers are serviced on an exchange basis through United Motors Service dealers. It is possible to change the rebound and compression valves, but owing to the fact that some of the internal parts are not supplied for field service, other internal repairs cannot be made except at the factory.

### Servicing the Delco-Lovejoy Double-Acting Inertia-Controlled Shock Absorber

Some model cars use the inertia-controlled type of two-way shock absorber, which is similar to the regular double acting type with the addition of an inertia weight which controls the cut-in period of resistance. The inertia weight is normally in a state of suspension, but is very sensitive to movements of the car body. Its action is to set up resistance in the regular relief valve before the movement of the shock arm is great enough to create this resistance.

Adjustment of the inertia weight is by means of shims located on top of the inertia weight spring. Adding shims makes a softer ride, while removing shims makes a firmer ride. To make this adjustment, remove the inertia weight cover by removing the center screw, and lift out the weight. The shims will be found underneath

the weight, on top of the spring. In order to maintain proper balance it is important that each shock absorber contain the same number of shims.

In between the inertia weight and the regular relief valve is a static valve, which is in operation only when the car is being driven on a smooth road. Its function is to supply a slight amount of control to the shock absorber prior to the operation of the inertia weight.

## Don't Overlook Worn Valve Stems

(Continued from page 32)

With a vacuum corresponding to 21 in. on the upper end of the valve guide and the valve operating at a speed equivalent to 1725 r.p.m., it was found that the leakage past the valve could be reduced 98 per cent when packing was installed. In this particular case the test was continued for 2000 hours and the clearance on the valve stem was .006 in. While the test was conducted at room temperature, the results are indicative of the savings that can be made under actual operating conditions.

## Hobbies

(Continued from page 26)

catalog boy can show broken wrists and knuckles for their pains in tackling the Japanese repairman in a round of "Kan-Do." When the jobbing houses hold staff meetings Matsumura is frequently invited to put on a "Kan-Do" act.

Matsumura started in the auto repair business a quarter of a century ago. His second hobby is buying new equipment, another reason why he is popular with the jobber salesmen. Although his shop is located in a residential district, doing general repair work, the equipment is said to be valued at \$30,000, consisting of grinders, lathes, hoists, and various types of jacks for heavy and light service. Matsumura takes his exercise with "Kan-Do," but lets his shop equipment take care of the heavy work.

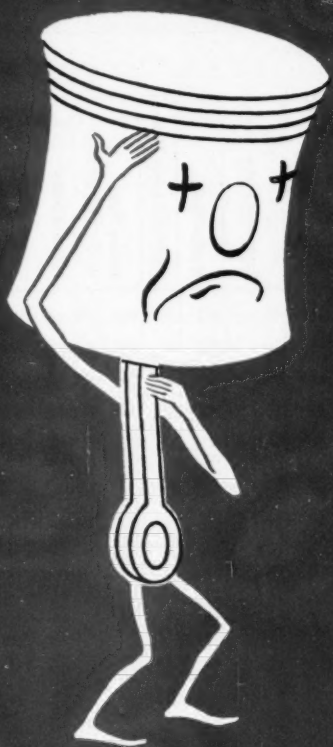
### Niehoff Has New Coil Kit

C. E. Niehoff & Company, Chicago, Ill., has announced a new coil kit consisting of two coils, one with regular winding, Type Y, and one with hi-speed winding, Type YH, together



with attaching brackets for quick installation on all of the popular cars. The kit, identified by No. Y-30, carries a list price of \$8.





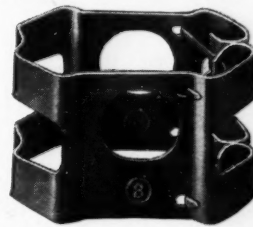
Since My Operation...  
I feel like a New Piston

● Installation of Perfect Circle Piston Expanders is a simple operation, and it's the *only* sure method of restoring worn, collapsed or distorted aluminum pistons to their original fit.

Always install Perfect Circle Piston Expanders when you're installing new rings on aluminum pistons. They'll stop piston slap—prevent pistons from wobbling in the cylinders, and keep the new rings riding squarely on the cylinder walls. Rings and pistons last longer, and there's less wear on cylinders.

Specifically engineered for each different type of piston, these expanders insure certain customer satisfaction, and provide increased profits for you.

Perfect Circle Piston Expander for Ford V-8



U. S. PATENT NOS. 1,985,039 DATED OCTOBER 25, 1932,  
AND 1,951,837 DATED MARCH 20, 1934

THE PERFECT CIRCLE COMPANIES • HAGERSTOWN, INDIANA, and TORONTO, CANADA

PERFECT CIRCLE

REG. U. S. PAT. OFF.

PISTON EXPANDERS

# Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the

Line Number	MAKE AND MODEL	Lowest Priced 4-door Sedan	Wheelbase (Ins.)	Tire Size (Ins.)	ENGINE																	CHASSIS					
					No. of Cylinders, Bore and Stroke	Taxable H.P.	Piston Displacement (Cu. Ins.)	Maximum Brake H.P. at Specified R.P.M.	Compression Ratio (to-1)	Displacement Factor †	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Clutch	Type and Make	Gearset Make	Universal Type and Make	Rear Axle Type and Make	Service Brake Type and Make		
1	Auburn..... 654	\$ 795	120	6.00/16	6-3 1/2 x 4 1/4	22.5	209.9	85-3500	6.20	37.4	Al.	Whit.	Al.	Pur.	AC.	Str.	Buf.	A.	USL	P.Long.	WG.	Nb-Mec	3/4 Col.	BH.			
2	Auburn..... 852	1095	127	6.50/16	8-3 1/2 x 4 1/4	30.0	279.9	115-3600	6.50	41.4	Al.	Whit.	Al.	Pur.	AC.	Str.	Buf.	A.	USL	P.Long.	Det.	Nb-Mec	3/4 Col.	BH.			
3	Auburn..... SC852	1545	127	7.00/16	8-3 1/2 x 4 1/4	30.0	279.9	150-4000	6.50	...	Al.	Whit.	Al.	Pur.	AC.	Str.	Buf.	A.	USL	P.Long.	Det.	Nb-Mec	3/4 Col.	BH.			
4	Austin.....		75	3.75/18	4-2.2x3	7.8	45.6	13-3200	5.30	...	CL	Spir.	Al.	No.	No.	Til.	Buf.	A.	USL	P.Rock.	WG.	F-Spi.	3/4 Sal.	M.m.			
5	Buick..... 36-40	885	118	6.50/16	8-3 1/2 x 3 3/4	30.6	233.0	93-3200	5.65	39.6	CL	LB.	Ala.	No.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	3/4 Own.	OH.			
6	Buick..... 36-50	1090	122	7.00/15	8-3 1/2 x 4 1/4	37.8	320.2	120-3200	5.45	...	CL	LB.	Ala.	AC.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	3/4 Own.	OH.			
7	Buick..... 36-80	1255	131	7.00/16	8-3 1/2 x 4 1/4	37.8	320.2	120-3200	5.45	40.7	CL	LB.	Ala.	AC.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	3/4 Own.	OH.			
8	Buick..... 36-90	1695	138	7.50/16	8-3 1/2 x 4 1/4	37.8	320.2	120-3200	5.45	...	CL	LB.	Ala.	AC.	AC.	Str.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	3/4 Own.	OH.			
9	Cadillac..... V8-60	1695	121	7.00/16	8-3 1/2 x 4 1/4	36.4	322.0	125-3400	6.25	45.7	CL	Mor.	Ala.	No.	AC.	Str.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec	3/4 Own.	BH.			
10	Cadillac V8-70 & 75	2445	131-38	7.50/16	8-3 1/2 x 4 1/4	39.2	346.0	135-3400	6.25	(a)	CL	Mor.	Ala.	No.	AC.	Str.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec	3/4 Own.	BH.			
11	Cadillac V12-80 & 85	3145	131-38	7.50/16	12-3 1/2 x 4 1/4	46.9	368.0	150-3600	6.00	(b)	CL	Mor.	Ala.	Han.	AC.	DL	Old.	D.	Del.	P.Own.	Own.	Nb-Mec	3/4 Own.	BH.			
12	Cadillac..... V16-90	7250	154	7.50/17	16-3x4	57.5	452.0	185-3800	6.00	43.7	CL	Mor.	Ala.	Cu.	AC.	DL	Own.	D.	D.	dp.Own.	Own.	Nb-Mec	3/4 Own.	KP.			
13	Chevrolet. Mas. Con.	640	113	5.50/17	6-3 1/2 x 4	26.3	206.8	79-3200	6.00	35.2	CL	Own.	CL	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	3/4 Own.	OH.			
14	Chevrolet. Mas. Ind.		113	5.50/17	6-3 1/2 x 4	26.3	206.8	79-3200	6.00	34.6	CL	Own.	CL	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	3/4 Own.	OH.			
15	Chevrolet..... Std.	575	109	5.25/17	6-3 1/2 x 4	26.3	206.8	79-3200	6.00	39.5	CL	Own.	CL	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	3/4 Own.	OH.			
16	Chrysler..... Six	875	118	6.25/16	6-3 1/2 x 4 1/4	27.3	241.5	93-3400	6.00	41.5	CI*	Ch.	Ala.	Pur.	Bur.	Car.	NS	A.	Wil.	P.B.&B.	Own.	Nb-UP.	3/4 Own.	LH.			
17	Chrysler..... DeLuxe 8	1045	121	6.50/16	8-3 1/2 x 4 1/4	33.8	273.8	105-3400	6.20	43.3	CI*	Ch.	Ala.	Pur.	AC.	Str.	NS	A.	Wil.	P.B.&B.	Own.	Nb-UP.	3/4 Own.	LH.			
18	Chrysler..... Airflow 8	1345	123	7.00/16	8-3 1/2 x 4 1/4	33.8	323.5	115-3400	6.20	41.8	CI*	Ch.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B.&B.	Own.	Nb-UP.	3/4 Own.	LH.			
19	Chrysler..... Air Imp. 8	1475	128	7.50/16	8-3 1/2 x 4 1/4	33.8	323.5	130-3400	6.50	42.4	Al.	Ch.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B.&B.	Otwg.	Nb-UP.	3/4 Own.	LH.			
20	Chrysler Air.Cum.Lin.8		137	7.50/16	8-3 1/2 x 4 1/4	33.8	323.5	130-3600	6.50	...	Al.	Ch.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B.&B.	Otwg.	Nb-UP.	3/4 Own.	LH.			
21	Cord.....	810	199	6.50/16	8-3 1/2 x 3 3/4	39.2	288.6	125-3500	6.50	...	Al.	Whit.	Al.	No.	AC.	Str.	Buf.	A.	USL	P.Long.	Own.	...	Tu Own	LH.			
22	De Soto. Airstream 6	810	119	6.25/16	6-3 1/2 x 4 1/4	27.3	241.5	93-3400	6.00	(c)	CI*	Ch.	Ala.	Pur.	Bur.	Car.	NS	A.	Wil.	P.B.&B.	WG.	Nb-UP.	3/4 Own.	LH.			
23	De Soto..... Airflow 6	1095	115 1/2	6.50/16	6-3 1/2 x 4 1/4	27.3	241.5	100-3400	6.50	35.6	Al.	Ch.	Ala.	Pur.	AC.	Str.	NS	A.	Wil.	P.B.&B.	Own.	Nb-UP.	3/4 Own.	LH.			
24	Dodge..... Six	735	116	6.00/16	6-3 1/2 x 4 1/4	25.3	217.8	87-3600	6.00	40.0	CL	Ch.	Ala.	Pur.	AC.	Str.	NS	A.	Wil.	P.B.&B.	Own.	Nb-UP.	3/4 Own.	LH.			
25	Duesenberg..... J		142-153 1/2	7.00/19	8-3 1/2 x 4 1/4	45.0	419.7	320-4200	5.20	...	CL	LB.	Al.	Pur.	Y.	Str.	...	D.	Exi.	dp.Long	Own.	m-Spi.	3/4 Own.	PH.			
26	Ford..... V8	580	112	6.00/16	8-3 1/2 x 3 3/4	30.0	221.0	85-3800	6.30	41.2	Al.	Gear	Al.	No.	Yes	Str.	Own.	O.	Own.	P.Os.	Own.	m-Own.	3/4 Own.	OM.			
27	Graham..... 6-80	665	111	6.00/16	6-3x4	21.6	169.6	70-3500	6.80	37.1	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	3/4 Spi.	OH.			
28	Graham..... 6-80A	625	111	5.25/17	6-3x4	21.6	169.6	70-3500	6.80	...	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	3/4 Spi.	OH.			
29	Graham..... 6-90	795	115	6.00/16	6-3 1/2 x 4 1/4	25.3	217.8	85-3300	6.70	39.7	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	3/4 Spi.	OH.			
30	Graham..... 6-90A	745	115	6.00/16	6-3 1/2 x 4 1/4	25.3	199.1	80-3300	6.70	44.2	Al.	LB.	Als.	No.	AC.	Mar.	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	3/4 Spi.	OH.			
31	Graham S. C. 6, 110	895	115	6.25/16	6-3 1/2 x 4 1/4	25.3	217.8	112-4000	6.70	...	Al.	LB.	Als.	Fram	AC.	Mar(s)	Old.	D.	Wil.	P.III.	WG.	Nb-Spi.	3/4 Spi.	OH.			
32	Hudson..... 6-63	785	120	6.00/16	6-3x5	21.6	212.0	93-3800	6.25	39.3	CI*	Ge.	Al.	No.	AC.	Car.	Old.	A.	Nat.	P.Own†	Own.	Nb-Spi.	3/4 Own.	BH.			
33	Hudson..... 8, 64-5-6-7	830	120-127	6.25/16	8-3x4 1/2	28.8	254.0	113-3800	6.00	(d)	CI*	Ge.	Al.	No.	AC.	Car.	Old.	A.	Nat.	P.Own†	Own.	Nb-Spi.	3/4 Own.	BH.			
34	Hupmobile..... 618-G	855	118	6.00/16	6-3 1/2 x 4 1/4	29.4	245.3	101-3600	5.75	45.4	CL	Mor.	Als.	No.	Bur.	Car.	Old.	A.	Wil.	P.B.&B.	WG.	Nb-Spi.	3/4 Spi.	LH.			
35	Hupmobile..... 621-N	1035	121	6.50/16	8-3 1/2 x 4 1/4	32.5	303.2	120-3500	5.80	47.3	CL	Mor.	Als.	No.	Bur.	Car.	Old.	A.	Wil.	P.Long.	WG.	Nb-UP.	3/4 Spi.	LH.			
36	Lafayette..... 3610	675	113	6.00/16	6-3 1/2 x 4 1/4	25.3	217.7	83-3200	5.61	39.4	CL	Whit.	Als.	No.	AC.	Str.	...	A.	USL	P.B.&B.	Own.	Nb-...	3/4 Own.	BH.			
37	La Salle..... 36-50	1185	120	7.00/16	8-3x4 1/2	28.8	248.0	105-3600	6.25	39.0	CL	Whit.	Al.	No.	AC.	Str.	Old.	D.	Del.	P.B.&B.	Own.	Nb-Mec	3/4 Own.	BH.			
38	Lincoln..... Zephyr	1275	122	7.00/16	12-2 3/4 x 3 3/4	36.3	267.3	110-3900	6.7	42.5	Al.	Gear	St.	Yes.	Str.	Own	O.	Own.	P.Os	Own.	m-Own.	3/4 Own.	MO.				
39	Lincoln..... V12		136-145	7.50/17	12-3 1/2 x 4 1/4	46.8	414.0	150-3400	6.38	41.5	Ala.	Ch.	Ala.	Pur.	Yes.	Str.	Own	A.	Exi.	P.Long.	Own.	m-Own.	FF Tim	M.			
40	Nash..... Ambassador	885	125	6.25/16	6-3 1/2 x 4 1/4	27.3	234.8	93-3400	5.70	36.8	CL	Whit.	Als.	Own.	AC.	Str.	...	A.	USL	P.B.&B.	Own.	Nb-Mec	3/4 Own.	BH.			
41	Nash..... Amb. Super 8	995	125	6.50/16	8-3 1/2 x 4 1/4	31.2	260.8	102-3400	5.25	36.5	CL	Ch.	Als.	Own.	AC.	Str.	...	A.	USL	P.B.&B.	Own.	Nb-Mec	3/4 Own.	BH.			
42	Nash..... 400	740	117	6.00/16	6-3 1/2 x 4 1/4	27.3	234.8	90-3400	5.61	42.2	CL	Whit.	Als.	...	AC.	Str.	...	A.	USL	P.B.&B.	Own.	Nb-...	3/4 Own.	BH.			
43	Oldsmobile..... F36	795	115	6.50/16	6-3 1/2 x 4 1/4	26.3	213.3	90-3400	6.00	39.2	CL	Whit.	Ala.	No.	AC.	Car.	Hay.	D.	D.	P.B.&B.	Own.	Nb-Mec	3/4 Own.	BH.			
44	Oldsmobile..... L36	910	121	7.00/16	8-3x4 1/2	28.8	240.3	100-3400	6.20	40.2	CL	Whit.	Ala.	No.	AC.	Car.	Buf.	D.	D.	P.B.&B.	Own.	Nb-Mec	3/4 Own.	BH.			
45	Packard..... 36-120B	1075	120	7.00/16	8-3 1/2 x 4 1/4	33.8	282.0	120-3800	6.50	41.8	Al.	Mor.	Als.	...	AC.	Str.	Old.	A.	Pre.	P.Long.	Own.	Nb-Mec	3/4 Own.	LH.			
46	Packard..... 38	2385	127-34-39	7.00/17	8-3 1/2 x 5	32.5	320.0	130-3200	6.50	37.9	Al.	Mor.	Als.	Pur.	AC.	Str.	Bur.	D.	Pre.	P.Long.	Own.	Nb-UP.	3/4 Own.	BP.			
47	Packard..... Super 8	2990	132-39-44	7.00/17	8-3 1/2 x 5	39.2	384.8	150-3200	6.30	40.7	Al.	Mor.	Als.	Pur.	AC.	Str.	Old.	D.	Pre.	P.Long.	Own.	Nb-Spi.	3/4 Own.	BP.			
48	Packard..... Twelve	3960	138-144	7.50/17	12-3 1/2 x 4 1/4	56.7	473.0	175																			



**Car Manufacturers and Supersede All Others Previously Published**

F—Flat  
F—(Pin locked in) Floating  
H—Hot L—Link  
Ma—Manual N—None  
P—(Pin locked in) Piston  
R—(Pin locked in) Rod  
Re—Retarded  
RZ—Rzeppa (Gear Grinding Machine Co.)  
S—Slide s—Sectors  
TC—Top Center

## Let Freedom Ring

(Continued from page 27)

The real reactionaries, today, are those who advocate more governmental control of this and that. They are facing in the wrong direction. They are looking backward. They are advocating conditions from which we freed ourselves only after years of tragic struggle. Our forefathers lived under governmental dictatorship. They were the serfs and slaves of the men in power. They fought, generation after generation, to get away from the very kind of control

and regulation which some, today, are saying we must have if men are to get what is rightly due them.

These advocates of more governmental control are the real reactionaries but they pose as the champions of progress. Some of them are honest but are ignorant of history, have forgotten it or are incapable of thinking their proposals through to the logical and inevitable consequences.

They have forgotten history? All right, let's forget history. What basis is there for the belief that government can do a better job of running our affairs than we can do ourselves? What is government? Government is

today, it was years ago and it will always be nothing more nor less than the efforts of one human being or a group of human beings—in any case, just plain, ordinary men—to manage public affairs. So long as men are what they are, government will be either what it is or what it has been.

Let's see what Walter Lippmann had to say on this subject not long ago. He is one of the best known and most respected of our writers on politics and economics. Incidentally, and for the benefit of any who may think he has political prejudices, in the last campaign he advocated the election of our present national administration. Here is what he said in slightly different words.

He said that governments—all governments, including any government that we could hope to have, the governments of all countries of the world, now and at all times—are composed, not of supermen, not of geniuses, but of mere men, men who are imperfectly educated, not entirely disinterested (they have political ambitions) and with very limited wisdom. He meant by the last statement, of course, that they do not and never can know all they should know to do a perfect job. Who does?

"Such men," said Mr. Lippmann, "can operate only a government of limited powers and no greater delusion has ever cast its spell upon the human imagination than that a group of mortal men can plan the future of a society [the relations of each of us to all the rest of us] and direct the affairs of a whole civilization." He added that to believe that they can is to display ignorance and to let them try is to put the country on the road to ruin.

Following the Declaration of Independence and the Revolutionary War, America adopted a Constitution. Those who wrote the Constitution knew what men are like and they gave America a government of limited powers. The Constitution which those men drew up has been amended many times. But, with the exception of the Eighteenth Amendment (Prohibition) and two or three which merely changed some of our governmental routine, every amendment has been drawn for the purpose of securing further the rights, privileges and freedom of the individual. We shall, of course, have more amendments as time goes by, but let us see to it that all these amendments are really forward looking and are not reactionary restrictions upon our liberty—obstacles in the path of true progress.

### Fulton Celebrates "25th"

#### As Accessory Producers

The Fulton Co., Milwaukee, celebrates this year its 25th anniversary in the automotive accessory field. Samuel A. Fulton, its president, organized the business in 1911, and points with pride at the accessory ideas introduced by his company which have been adopted as standard by all car manufacturers.

In the honor of the anniversary event a booklet containing a brief history of the company and interesting views of its current activities is being distributed by the company.



**GENUINE**  
*Weatherhead*  
**FUEL LINES**

**SPLASH**

● NEW MERCHANDISER for garage and service station. 17 gas, oil, grease and vacuum assemblies for popular makes of cars. Replace with lines used as original equipment by over 90% of car manufacturers.

**THE WEATHERHEAD CO.**  
632-714 Frankfort Avenue • Cleveland, Ohio



# CHAMPIONS WIN AGAIN!



## 13<sup>TH</sup> CONSECUTIVE VICTORY AT INDIANAPOLIS!

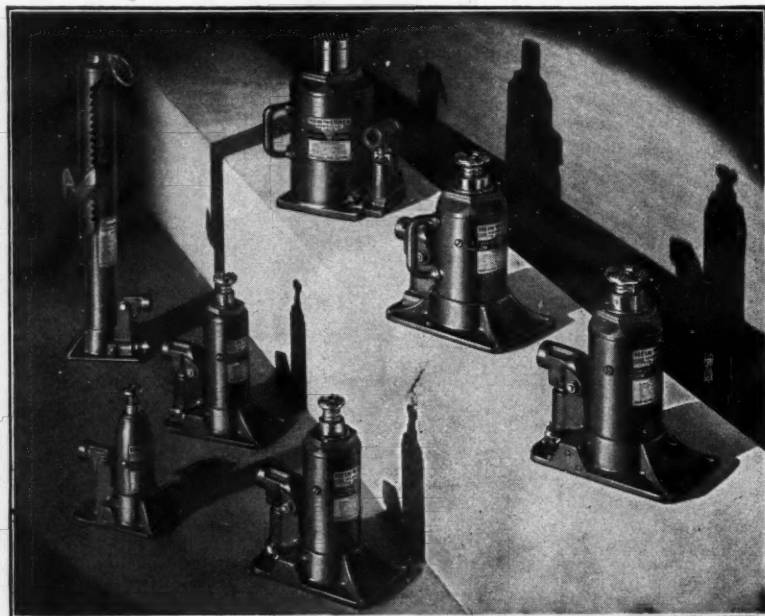
Louis Meyer set a new track record of 109.069 m. p. h. with Champion Spark Plugs to win the 1936 Indianapolis 500 Mile Race. First ten

cars to finish used Champions. Gas limitation of 37½ gallons required maximum speed with economy. Champions insure both in every car.

**SELL THE SPARK PLUGS CHAMPIONS USE**

MOTOR AGE, July, 1936

Look 'em all over—and you'll agree  
**HEIN-WERNER JACKS**  
 are Great Values



**A COMPLETE LINE ... Built Right ... Priced Right**

Comparisons quickly prove our contention that Hein-Werner offers unmatched values—and that you can't buy better hydraulic jacks at any price.

This complete line includes the "Bullet" 1½ ton model at a new low price of \$2.80 (West Coast \$3.10) ... 3 ton models at \$7.95 (West Coast \$8.45) ... 5 ton models \$9.95 (West Coast \$10.65) ... 7 ton models \$13.45 (West Coast \$14.50) ... 12 ton models \$19.95 (West Coast \$21.00) ... 20 ton models \$30.00 (West Coast \$31.00).

**NEW MODEL BUMPER-LIFT \$4.95 (West Coast \$5.65)**  
 ... Hooks under bumper arm of modern cars. No need for motorist to get on knees or crawl under car to position or operate this jack ... All prices are net to dealer.

**"ZEPHYR"**

Model 0324



**\$49.50**

**NET TO DEALER**  
 (West of Denver \$55.00)

The low, long sweeping lines of the new "ZEPHYR" Model 0324 Hydraulic Floor Jack are in keeping with modern service needs ... This quick action, easy operating jack has a low "positive grip" saddle that goes down to within 4" of the floor ... Has low, wide sturdy caster wheels (4" dia.) front and rear ... Handle can be locked in three positions, and is easy to operate over any part of 90° arc ... Lifts to height of 24½" ... Has automatic oil level—and will not leak oil ... Capacity 6,000 lbs.

**HEIN-WERNER MOTOR PARTS CORP.**  
 WAUKESHA, WISCONSIN

FEW MODELS ENGINEERED TO DO THE WORK OF MANY  
**HEIN-WERNER**  
*hydraulic JACKS*

**1935 Gasoline Consumption  
 Up 6.4 Per Cent Over 1934**

Gasoline consumption for highway use in the United States totaled 16,264,961,000 gals. in 1935, according to the most recent estimates of the Bureau of Public Roads, Department of Agriculture. This represents an increase of 6.4 per cent over the previous year, and the bureau reports that the figure includes some gas sold for non-highway use in the 13 States which do not allow refunds for this purpose.

Total State revenue receipts amounted to \$619,677,466, a figure which is not directly comparable with the previous year owing to a change in the refund policies. The average State tax rate amounted to 3.8 cents per gal.

**Adler-Trumpf Sets New  
 International Speed Records**

A series of new international records, Class E, made by the Adler-Trumpf, has just been recognized by the Association Internationale des Automobile-Clubs Reconnus. Class E covers cars having engines of from 1100 to 1500 cu. cm. piston displacement.

The Adler-Trumpf made the record runs on the new automobile road from Frankfurt-am-Mein to Virnheim. It was equipped with a four cylinder engine having a bore of 75 mm. (2.95 in.) and a stroke of 95 mm. (3.74 in.). The displacement was 1678.7 cu. cm. (102 cu. in.). Drivers were: Löhr, v. Guillaume, Heckel, Graf, Orsich and Sauerwein.

The records established were as follows:

2000 kilometers in 12 h., 30 min., 40 sec., 47/100 at an average speed of 159.856 km. p. h. (99.33 m.p.h.).

2000 miles in 19 h., 55 min., 18 sec., 60/100 at an average speed of 161.565 km. p. h. (100.39 m.p.h.).

3000 kilometers in 18 h., 35 min., 25 sec., 40/100 at an average speed of 161.374 km. p. h. (100.27 m.p.h.).

4000 kilometers in 24 h., 56 min., 28 sec. at an average speed of 160.378 km. p. h. (99.65 m.p.h.).

In 12 hours, 1913.812 kilometers were run at an average speed of 159.484 km. p. h. (99.10 m.p.h.).

In 24 hours, 3854.356 kilometers were covered at an average speed of 160.598 km. p. h. (99.79 m.p.h.).

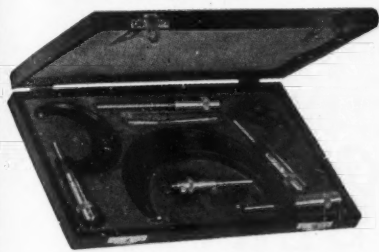
**Prices of Ford DeLuxe Models  
 Raised \$20, Accessories Added**

Ford Motor Co. has increased the price of its deluxe models by approximately \$20 due to the inclusion of several accessories as standard equipment which heretofore were optional. The items added to the deluxe accessories group are flexible steering wheel, glove compartment lock, and rear view mirror with 30-hour clock installed.

Improvements have been made in the interior of standard models without change in price.



## Here's A Real MICROMETER BARGAIN



A SIX PIECE SET—0" to 3 3/4" Inside  
0" to 4" outside

**\$11.95 COMPLETE**

This set consists of four genuine Brownie, American made Micrometers complete with all fittings to cover range indicated, and packed in serviceable leather case. A Real Buy. Also in the same quality, a

0" to 1" MICROMETER—Only \$1.50  
All outfits fully guaranteed. Send money order or will ship C.O.D.

Dept. 1  
**MICRO PRODUCTS CO.**  
316 Murphy Bldg.  
155 W. Congress St.  
DETROIT

## SAVE TIME WITH HOOSIER BRAKE LINING IT'S F-L-E-X-I-B-L-E

Why wrestle with stiff, stubborn brake lining and lose time, when you can install Hoosier F-L-E-X-I-B-L-E Brake Lining and save time! It's flexible. You can bend it like a belt. Changes many a brake re-lining job from loss to profit. It's tough and longer lived because it has no gritty spots to glaze. Brakes are trouble free from the day you install Hoosier Flexible Molded Brake Lining.

**HOOSIER BRAKE LINING CORP.**  
NORTH MANCHESTER INDIANA

**Ahlberg** Ground Bearings


**40%**

Saving Over New Bearing Costs

**AHLBERG BEARING CO.**  
Chicago

Branches and Distributors  
Everywhere

**Ahlberg** Ground Bearings



**STANDARD  
REPLACEMENT PARTS  
for  
SPEEDOMETERS  
CARBURETORS  
FUEL PUMPS  
LIGHTING & IGNITION**

**BLACKSTONE MANUFACTURING COMPANY**  
INCORPORATED  
1430 SOUTH MICHIGAN AVENUE  
Chicago, U.S.A.

WRITE FOR COMPLETE CATALOG

## Fuel Economy

(Continued from page 25)

needle valves for wear. The jets and needle valves, shown in the illustrations, when examined by the naked eye appeared to be in good condition. But upon examination under a magnifying glass, the wear was discernible.

Jets should also be checked for proper size and when possible tested on a flow meter in comparison with a new jet of the proper size. The reason that jets must be checked so carefully is that they wear, due to the passage of the fuel through the orifice. Care must be exercised in replacing these parts to see that there is a gas-tight joint around the thread. Also jets that are fitted with gaskets must always be replaced with a gasket of the correct thickness, as any difference in the height of such jets will change air fuel ratio, due to difference in suction at the outlet of the jet.

In connection with the needle valves, both needle and seat should be replaced, otherwise a leak will result. After making such a replacement, it is always necessary to readjust the fuel level. Fuel pumps should also be checked so as to be sure they are delivering fuel at 2 1/2 to 3 lb. pressure. If the pressure is in excess of the specified amount, needle valves will leak, and if less than the required amount there may be insufficient fuel for full throttle operation.

Particular attention should also be paid to metering rods, which should be replaced if any wear is found. Step-up pistons should work in their guides without sticking. The piston springs should never be stretched to restore tension. Power jet needles must be straight and work freely in their guides. A bent or sticking needle will cause failure of the step-up piston to work at full throttle and will materially affect performance. All ball checks must be mouth pressure tight.

Accelerating pump plungers must fit the pump barrel and both plunger and barrel must be free of burrs and scores. The leather cup type of plunger should be examined to see that it exerts a slight pressure against the barrel. In replacing this type of plunger the leather cup should first be soaked in gasoline before assembly and installed in the barrel with a few drops of oil.

Throttle shafts should be examined for proper fit in the throat body and when any noticeable wear is found in either part, the shaft and in many cases the body also should be replaced. However, some types of throat bodies can be rebushed. But unless the throttle shaft is a close fit in the throat body, there will be an air leak which will require a richer adjustment resulting in reduced economy.

When renewing a throttle shaft, it is always advisable to install a new throttle valve as well. Throat bodies should always be checked for roundness and the flange should also be checked to be sure that it is flat. If either of these conditions exist, a new throat body should be installed, otherwise poor idling will result.

Choke valve shafts should be handled in the same manner. And last, but not least, when assembling the carburetor all passages must be clean.

# Lubrofacts

FOR JULY  
By C. C. CURTIS,  
Lubrication Engineer  
HALSTEAD PRODUCTS COMPANY

## QUICK ACTION PURGE EVERY 2,000 MILES

A sluggish motor is a costly one. It lacks power—pick-up—and speed. It wastes gasoline. Poor motor performance can generally be traced to gum and carbon formations in the cylinders, valves and rings. Modern high r.p.m. motors are severely affected by these deposits. A quick-action purge with Halstead TUNE-UP Oil every 2,000 miles dissolves the gums and releases the carbon. Hundreds of repair shops and service stations have adopted this repowering program, using Halstead Tune-Up Oil.

## CONVINCING PROOF OF TUNE-UP OIL

A series of 80 recorded tests conducted by fleet-owners and used car dealers prove the value of Halstead Tune-Up Oil. In each test compression was "leveled out." Sticky rings were freed. And the manifold vacuum was stabilized. Hill Climb Power and acceleration were vastly improved. Nearly one-eighth of a pound of solids was removed from exhaust gases. Analyses show these solids consisted of 15% to 30% insoluble carbon. The balance was made up of gums, resins, and a very small percentage of oil.

## EASY APPLICATION REQUIRES ONLY FEW MINUTES

A half-pint of Halstead TUNE-UP Oil poured through the carburetor air-intake does the job as the motor idles. The balance of one-half pint may be poured into the gasoline, one-half pint to ten gallons of gasoline. No dismantling of motor necessary. This quick-action purge and minor inspection retails for one dollar and up, yielding steady profits for service stations, car dealers and repair shops. The results are completely satisfying to the customer. Concentrate on Motor Tune-Up and Motor Check-Up and your Repair Business will automatically grow.

## COMPLETE MOTOR CHECK-UP EVERY 5,000 MILES

Halstead TUNE-UP Oil is also the basis for a more thorough 5,000 mile motor check-up service. This up-to-date service offered by garages, car dealers and service shops includes complete testing and adjusting followed by a purge with TUNE-UP. This program not only yields immediate profits, but it uncovers needed repairs, helps the sale of replacement parts, and gives customers' cars peak performance.

## SPECIAL FREE SALES HELPS

Motor Tune-Up Placards outlining the various inspections and adjustments are available to you. Floor and counter display racks are available to jobbers and large users. Remember TUNE-UP OIL is a product of the makers of famous SPRINGEEZ. HALSTEAD PRODUCTS CO., 2937 Chapman Street, Oakland, Calif.

**T**HE better the piston rings you install, the more they deserve Thexton Piston Expanders to lengthen their life and increase their efficiency.

## THEXTON PISTON SKIRT EXPANDERS

THEXTON MANUFACTURING CO., Inc.  
Minneapolis, Minnesota  
Canadian Branch • Chatham, Ontario

Radiator, battery repairing and all sorts of soldering jobs easily done with the

### TORIT Acetylene Torch No. 23

Simply connect to Presto Tank. Includes a set of 4 tips. Price, \$6.75.

**TORIT MFG. CO.**  
290 Walnut St., St. Paul, Minn.



### FASTIK PRICE MARKED PATCHES



New Merchandising Plan Increases Dealers Patch Sales and Tire Repairs.

**FASTIK DEALERS**  
Don't lose patch sales to chain stores

**FASTIK PATCHES**  
ARE NOT SOLD  
BY GIPS OR CHAINS

**INCREASE YOUR SALES  
MAKE MORE MONEY**

Ask Your Jobber or Write the Manufacturer

**H. R. THOMSON, INC.**  
1059-1073 EAST 76th ST., CHICAGO, ILL.

### Chicago Installs 18 Weaver Safety Lanes for Inspections

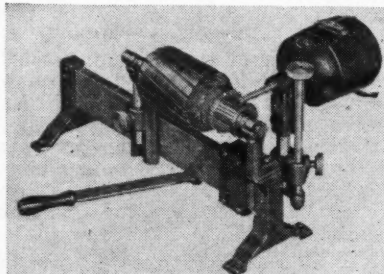
The City of Chicago inaugurated a program of official motor vehicle inspections July 1, of a type similar to that now in operation in the State of Connecticut. Every motor vehicle owned and operated in Chicago will be inspected twice each year for safety, under the terms of an Ordinance passed by the City Council.

No direct inspection fee will be assessed against the vehicle owners, but they will be notified when and where to appear for first inspection. A small windshield sticker, dated, will mark those cars which satisfactorily pass the tests—other cars will reappear within 10 days at the Safety Lane to show that necessary adjustments have been made, and receive their sticker.

Chicago traffic engineers placed an order for 18 Weaver Safety Lanes, consisting of Wheel Alignment Indicators, Brake Testers, and Headlight Testers. Six of these Lanes will be of Heavy Duty size, capable of testing the largest trucks and buses. The rest will be in "Universal" size, for handling passenger cars and trucks up to 2 tons.

### TRUCUT Line Includes New Mica Undercutter Machine

A new machine for mica undercutting of starter and generator commutators has recently been announced by Frank N. Wood Co., Milwaukee, Wis., makers of TRUCUT equipment. It is claimed that this new Undercutter machine will handle centered and uncentered armatures,



in sizes from 3/4 to 4 1/4 inches in diameter, up to 1 1/4 inches long. Will handle any length automotive armature with core diameter up to 5 1/2 inches. Positive lateral travel of undercutter is provided by means of a long hand lever. A vertical adjusting screw regulates depth of cut. Furnished with 3 circular saws and direct drive motor.

## GARAGE and REPAIRMEN!

Make **EXTRA** Profits  
and  
**MORE MONEY**  
with our **NEW**

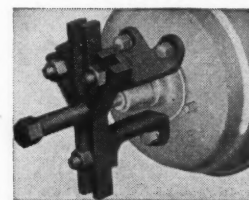
"EVERY-DAY" CATALOG

**Genuine  
SERVICE**  
INDIANAPOLIS  
"Measurably Better"  
**SPRINGS**

and **HELPER** Springs  
**ASK YOUR JOBBER  
OR WRITE US TODAY  
FOR NEW FREE CATALOG**

Manufactured only by  
**SERVICE SPRING CO.**  
INDIANAPOLIS, IND.

## 3 IN 1 WHEEL PULLER

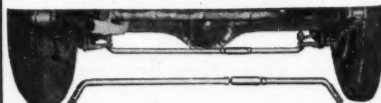


\$7.50 delivered.

Pulls wheels, hubs, gears, etc., quickly, easily on 98% of all 1929-36 cars. Three complete tools for less than the price of one. A time and money saver every shop needs. See your jobber or write direct.

SPRINGFIELD WHEEL PULLER CO., 510 Hubert St., Springfield, O.

## STOP THOSE THUMPS AND RUMBLES!

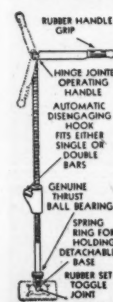


### SPRING SADDLE SILENCER

Get to the root of these rear end thumps and rumbles! Curtiss Spring Saddle Silencer stops them because it stops the cause. No more sideways in spring saddle—no more noise! 15 minutes to install on any car having floating spring seats. It will outlast the car! \$2.50 list. See your jobber or write to us.

**CURTISS & SMITH MFG. CORP.**  
POTTSTOWN PENNA.

## WOODWORTH



### BALL BEARING BUMPER JACK

Jacks up the wheel without stooping. No Gears, Ratchets or Springs to get out of order. Guaranteed Trouble-Proof. Low Prices—Generous Discounts. Write for Description and Prices.

**WOODWORTH  
SPECIALTIES CO.**  
BINGHAMTON, N. Y.

It Spreads Like Butter!

Body workers! Use the body solder that **KEEPS PLASTIC LONGER**... that gives you time to round out contours smooth as silk... that is most economical to use! Ask your jobber for **GLASER BODY SOLDER** by name. Glaser Lead Co., Brooklyn, N. Y.

**UNBEATABLE!**  
**Glaser Special**  
**1/4" Round**  
**Spray Gun Solder**

## GLASER



### BODY SOLDER



## BETTER RESULTS

Gardiner Acid-Core Solder costs less and goes further than ordinary or "nameless" solders. Its uniform high quality guarantees neater, faster work... preferred by amateurs and experts who know how much "easier" it handles.

Write for generous sample and mention the name of your jobber.

Other Gardiner products include bar, body and solid wire solders and babbitts.



4839 So. Campbell Ave., Chicago, Ill.



20 Ton Hydraulic Press. Handles all passenger car, and light truck work. Solid cast head—frame, cylinder and oil box cast as one. Table pins heat treated chromium nickel steel. Gauge and adjustable auxiliary table extra. \$79.50 Price

MANLEY PRODUCTS CORPORATION  
State and Hay Sts., York, Pa.

**REMCO**  
SHOP EQUIPMENT  
Hydraulic Presses, Wrecking Crane, Car Washers, Jacks, Trestles, etc.



### A BUELL AIR HORN

Is Powerful Enough to Get Attention and action  
Sound Range 1 to 10 miles

A necessity to buses and trucks

Write for Literature and Resale Discounts  
**BUELL MANUFACTURING COMPANY**  
2989 COTTAGE GROVE AVE., CHICAGO, ILL.

## FREE AN ACCURATE TESTER

to every dealer who takes delivery of 24 gallons (or more) of

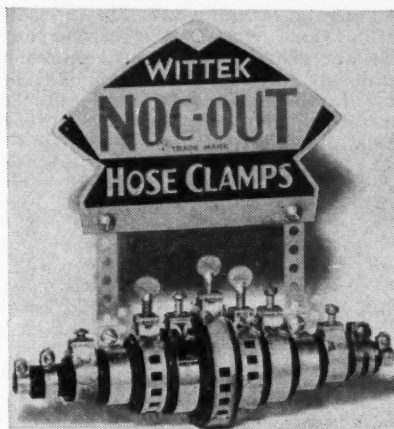
# EVEREADY PRESTONE

BEFORE OCTOBER 15, 1936  
—CALL YOUR JOBBER

## "NOC-OUT" Hose Clamp Display by Wittek

A permanent metal display, designed to either hang in the window or mount on a stock board, is being offered free to jobbers and dealers with every order for one hundred clamps from Wittek Mfg. Co., Chicago, Ill. The display is finished in ebony and chrome.

The Wittek line comprises clamps designed for water, air, gas, ground, steam, vacuum brakes, air hose and paint spray outfits.



## Kreger Floating Brake Wedge Bolts Introduced

Floating brake wedge bolts, which are said to insure increased positive brake action and at the same time stop chatter, are a new replacement product announced by the L. F. Kreger Mfg. Co., Chicago, Ill. Designed for replacement on 1928 to 1934 Ford cars, these wedge bolts are said to be the same as those used as original equipment on 1935 and 1936 models. They are designed to equalize the brake action of the front brake shoes.



## Garage Enlarges

The Lincoln Highway Garage Co., Inc., Valparaiso, Ind., which claims to have one of the most complete garage setups along the Lincoln highway from coast to coast, is enlarging again. After a new brick building was completed next door to the two-story garage building, into the new structure the parts department was moved. This allowed room in the main building for moving the electrical department forward so that it can be seen night and day through show windows. Additional space is furnished for the service floor.

# MARVEL MYSTERY OIL

FOR

## MOTOR TUNE UP

Frees sticky valves and rings. Produces a more permanent job. Continues to work while motor is driven.

## MOTOR BREAK IN

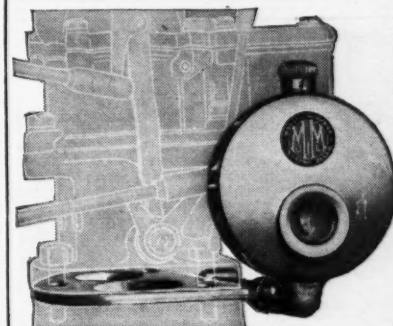
20% added to SAE 30 Crank Case Oil affords protection against seizure dangers and too rapid wear.

## NON-CORROSIVE

to any metals and is used in motors with copper, tin, lead and cadmium-silver bearings.

## FILM STRENGTH

carries Timken load of 25,000 lbs. per square inch.



## MARVEL MYSTERY INVERSE OILER

### Automatic Feed

to power, load and speed requirements.

### ALL TYPES FOR

Passenger Cars, Trucks, Buses and Motor Boats

## SPECIAL OILERS FOR

FORD, CHEVROLET, DODGE, PLYMOUTH and PONTIAC

Complete unit of Oiler, Flange, Bracket, Quart Container and Oil Gauge.

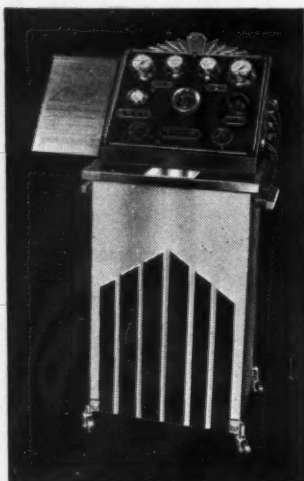
LIST \$4.75

One Trial is Completely Convincing of Necessity of Top Cylinder Lubrication with MARVEL MYSTERY OIL and MARVEL MYSTERY INVERSE OILER.

Order through your jobber.

**EMEROL MFG. CO., INC.**

242 West 69th St., New York City



### A NEW TESTER

- Sold Under a New and Sensational Plan
- See Your Jobber
- Features every necessary Test

Equipped with Telephone type jacks and plugs; Motorized Breaker; Precision Spark Gap; 0-600 and 0-30 Ammeter; Combination Vacuum and Fuel Pump tester; Combination Compression and Oil Pressure.

A new and sensational tester engineered correctly.

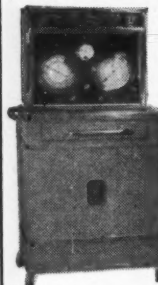
Your jobber can deliver this tester to you under a surprisingly low price plan. See him at once.

Write for complete descriptive catalog page.

**BESCO PRODUCTS, Inc.**  
7524-30 Greenwood Ave., Chicago, Illinois.

### NEW MOTOR ANALYZER

by Lantz-Phelps



Tests both combustion and mechanical condition. Enables you to merchandise work orders to car owner quicker than ever before. This L-P Motor Analyzer finds faults in motor operation—proves you fixed them. The outstanding testing equipment of recent development.

Send for catalog pages—full details.

**THE LANTZ-PHELPS CORP.**  
941 E. Third St., Dayton, Ohio

### JUST POUR WONDERWELD IN CRACKED ENGINES!

Seal cracks in valve seats and water jackets in thirty minutes without teardown. Just pour Wonderweld in top hose connection of hot block. Wonderwelding is permanent. Money back if not satisfied. Repair blocks with Wonderweld, charge less, make more, give lightning service. Your jobber has Wonderweld—if not, write us and tell his name.

**MILLER MANUFACTURING CO.**  
1218 KAIGHN AVE., CAMDEN, N. J.

### GENUINE



### PISTON PINS

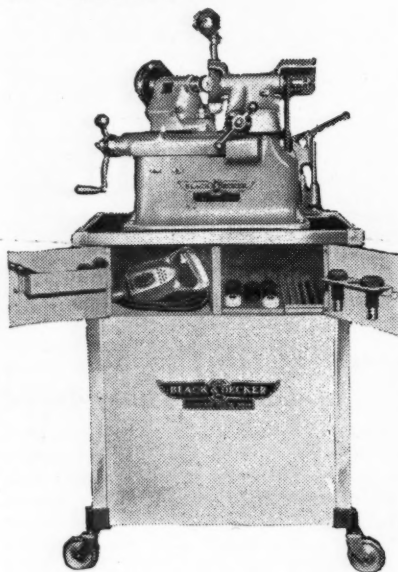
The acknowledged  
Standard of Quality  
for over 20 years.

ASK YOUR PARTS JOBBER

**BURGESS NORTON MFG. CO.**  
GENEVA, ILL.

### Black & Decker Portable Valve Grinding Unit

The Black & Decker Mfg. Co. of Towson, Md., has announced a large, portable valve grinding unit that is said to contain all the equipment for complete valve conditioning service. A new model Super-Service valve refacer is mounted on the top of the cabinet. Equipment includes a Vibro-Centric valve seat grinder, complete with driving unit, pilots, stones and stone sleeves, carbon cleaning brushes and valve guide cleaners. Storage space is provided in the back of the cabinet for small parts, hand tools, drills, rags, etc. Two electrical outlets are provided for tools, extension lamp, etc., in addition to the adjustable lamp above the valve refacer. A 20-foot cable supplies current from the wall socket.



### Champion Introduces Anti-Rattler Kit

To assist in merchandising proper sizes of anti-rattler springs, Champion Anti-Rattler Co., Inc., St. Louis, Mo., has introduced their Kit No. 701 containing an assortment of eight springs for use on Ford V-8 models. List \$0.35 per kit.



The Federal-Mogul Corp., Detroit, Mich., has recently issued their 1936 Catalog covering a complete line of bab-bitt and cadmium-silver-copper alloy bearings, shims, piston pin bushings and other parts. A copy will be sent free, upon request.

**WRITE to Larry Kreger**  
**Kreger Manufacturing Co.**  
544 W. 35th Street, Chicago  
for Catalog • Information • Prices

GOOD **KREGER** PRODUCTS

### DO A BETTER JOB with the RIESS GP LATHE

A general purpose machine for turning and grinding . . . brake drums . . . flywheels . . . reaming and drilling . . . turning armatures and pistons . . . write for details.

**RIESS MANUFACTURING CO.**  
Kokomo, Indiana

### GENUINE NIEHOFF PRODUCTS

Approved Quality

**IGNITION PARTS**  
**COILS AND CONDENSERS**  
**TESTING EQUIPMENT**  
**CUTOUTS-BRUSHES**  
DISTRIBUTED BY LEADING JOBBERS

**C.E. NIEHOFF & CO.**  
230 W. SUPERIOR ST., CHICAGO, ILL.

### prest-o-lite

**HILEVEL  
BATTERIES**

The Sensational Selling  
Leader of an Outstanding  
Line that last year Topped  
All Prest-O-Lite records.

**PREST-O-LITE BATTERY COMPANY, Inc.**  
Indianapolis, Ind.      Toronto, Can.  
Oakland, Calif.

*Good Electric  
Soldering  
Irons*  
*Mean More  
Profit to You*

Electric Soldering Iron Co., Inc.  
342 West 14th St.      New York City

**ESICO**  
REG. U.S. PAT. OFF.



## Get Into Wheel Balancing!

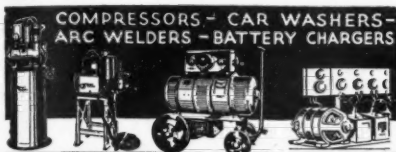
### L & H Adjustable Balancing Weights

Easily adjustable without removing or deflating tire. Corrects shimmy, tramp and excessive tire wear. Never get loose on wheel. Easiest to install. Sold by leading jobbers. Investigate!



WRITE  
for  
CIRCULAR!

HARLEY C. LONEY CO.  
16517 Wisconsin, Detroit, Mich.



Ask for money-saving prices on this high quality equipment. 30 Days' Trial without obligation will convince you of its profit possibilities—liberal terms lets the equipment "pay-for-itself" out of extra business profits. Check the items you're interested in and mail this ad with your letterhead for complete details on these profit makers.

☐ Upright Air Compressor ☐ 8-Hr. Battery Charger  
☐ Hi-Pressure Car Washer ☐ Test Bench ☐ Portable Paint Spray ☐ "Simplified Arc Welding"

HOBART BROS., Box MA-76, TROY, OHIO



### Sectional Piston Rings Eliminate Reboring

Champion Multi-section Piston Rings give sensational performance. Results guaranteed or your money back. Write for circular and trial installation offer.

CHAMPION PISTON RING CO.  
51 W. HANCOCK DETROIT, MICH.

### TIRE GROOVING is PROFITABLE!

And the world's finest equipment for doing it is made by KWICK-KUT!

Both PUSH type and PULL type grooving tools for either PATTERN blades or RIBBON blades.

The most complete line made, fully patented. Used by world's largest tire factories. Prices start at \$6.50. Ask your jobber or write!

Kwick-Kut Mfg. Co., Inc. 3854 Arsenal St. ST. LOUIS, MO.

### FAVORITE IN COIL TESTER SWEEP STAKES



A & C  
POCKET  
COIL TESTER  
IS JUST LIKE  
MONEY IN  
YOUR PANTS

A & C costs but \$1.25

A & C Manufacturing Co.  
1613 N. 18th Street, Philadelphia, Pennsylvania

## Steady Expansion Reported at Imperial Brass Meeting

The semi-annual gathering of the sales organization of the Imperial Brass Mfg. Co. was held at the Chicago headquarters last month. The meetings were held every day from Monday to Friday, and included a banquet held at the Hamilton Club, at which addresses were made by Mr. Frank McNellis, president, Mr. W. A. Leonard, vice-president, and other officers of the company.

A large part of each day was occupied with business meetings, at which the reports submitted from different territories showed steady advances during the last half year. Progress made was credited in great measure to the company's practical cooperation with its jobber connections, which is kept in line with changing trade conditions.

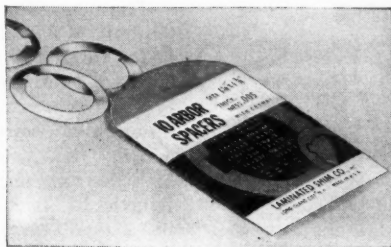
This policy, it was pointed out, extends to the constant modernizing of selling and display equipment. An example, exhibited at the meetings, is the set of new steel cabinets for copper tubing, fittings and flexible tubing, both in standard lengths and in coils.

To simplify the marketing of the coils, the cabinet drawers containing them are equipped with cutting and measuring equipment which makes quick and clear demonstration a much easier matter. Each of these has a hacksaw in the compartment at the front.

Smaller cabinets for the dealer were also exhibited. The star exhibit was the "Adda-Drawer" cabinet, consisting of a frame and five drawers for holding assortments of fittings of all type.

### Arbor Spacers Packaged

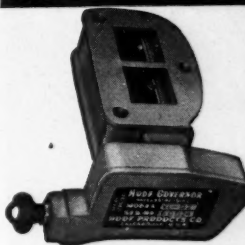
The Laminated Shim Co., Long Island City, N. Y., is now supplying arbor spacers, or shims, in convenient waterproof envelopes, preventing damage and waste in handling. The spacers are packed ten to an envelope, and are supplied in six sizes and eight different thicknesses, ranging from .001 to .020 in. Each envelope is plainly marked with the size of the contents. Spacers are also supplied, 20 to an envelope, in assorted thicknesses, with a choice of six sizes.



The Continental - Diamond Fibre Co., Bridgeport, Conn., is offering a new display stand featuring a selection of Celeron Timing Gears. The display may be used on the counter in the form of a triangle stand, or may be opened so that the three sides present a front view. Net cost to garages, including a selection of four gears, is \$13.22.

## HOOF GOVERNORS

Used  
Exclusively  
on Hundreds  
of National  
Fleets



HOOF  
PRODUCTS CO.  
162 N. FRANKLIN ST.  
CHICAGO, ILL.

## LINKERT

The  
WORLD'S OUTSTANDING  
CARBURETOR

and  
PERFECT PARTS

Replacement Line  
for All  
Popular Carburetors

LINKERT CARBURETOR CO.  
INDIANAPOLIS, INDIANA



Flint the Loss-Proof  
Compression  
SPARK PLUG!

Highly endorsed by fleet owners because of their uniformly excellent performance, longer service and lower cost per mile. Made in the correct types for every motor.

Order from your jobber!  
Write for literature!

C. V. S. Manufacturing Co.  
Flint, Michigan

\$1.50 and  
Worth More

No. 511  
Ring Groove  
Cleaner



Works on old or new type pistons. Locked in groove, can't cut too wide. Compensating spring prevents chatter or catching in oil holes.

National  
MACHINE & TOOL CO.  
JACKSON, MICHIGAN

## STEELCRAFT



### PISTON RING

Fits tapered and out-of-round cylinders without reboring. Restores compression stops loss of oil and increases gasoline mileage.

Write for  
Particulars

Steelcraft Piston Ring Sales, Inc.  
1017 Franklin Street, Detroit, Michigan



GENTLEMEN!  
YOU ARE ABOUT  
TO SEE —

THE Sensational New  
LION SLEETCHASER

**COMPARE ALL THREE!**

Wait until you see the New and SENSATIONAL LION SLEETCHASER set-up. We've combined beauty with efficiency plus value. It's going to be the line that sells itself.

LION PRODUCTS COMPANY, Lynn, Massachusetts, U. S. A.

**Quality**

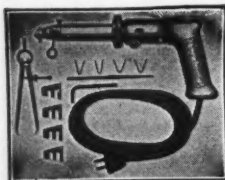
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**WITTEK MFG. CO.**  
4305 W. 24th Pl., Chicago, U.S.A.

## New Intra-Department Communicating System

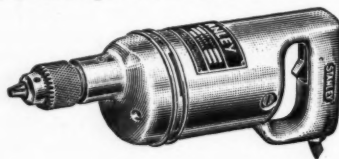
Bell Sound Systems, Inc., 61-63 East Goodale St., Columbus, Ohio, has announced a new intra-department communicating system, trade named "Belfone," which is said to incorporate certain principles of radio, using an amplifier, microphone and loud-speaker.

With a box approximately the size of the smallest midget radio placed on the desk or counter, one just flips a key and talks in a normal voice. Amplified and received by a combination of loudspeaker and microphone, the person at the other end distinctly hears and replies. A volume control and two different types of loudspeaker permits the voice received to be of any degree of loudness for the quick communication with a party at various places in the department. Even though a person may be standing 25 or more feet from the receiver his reply, in a normal voice, will be picked up and transmitted.

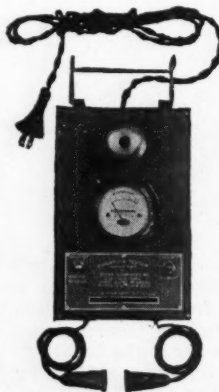
By a combination of two or more of these systems it is claimed that a number of simultaneous conversations can take place by means of a selector key. A two-way system is priced at \$39.50.

## Stanley Presents "Victor" Electric Drill No. 114

The Stanley Rule & Level Plant, New Britain, Conn. has announced a new electric drill "Victor" No. 114, to sell for \$19.50. It is light in weight and measures 12 inches in length. It is described as having a capacity up to 1/4 inch in steel, and has a Universal motor, operating on either D.C. or A.C. current, 60 cycles or less. The motor housing and handle are cast in one piece from a strong aluminum alloy, and the drill is said to operate at a load speed of 1400 R.P.M.



## Condenser Tester Offered By Joseph Weidenhoff



The new Weidenhoff Model 864 Condenser Tester definitely indicates amount of condenser leakage by the varying length of light in a red neon column. Condenser capacity is shown on a meter in fractions of a microfarad.

Made by Joseph Weidenhoff, Inc., Chicago, Ill.

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